

Manufacture of Unit Equipment for the Pulp and Paper Industry

N. S. Raman

India has made considerable progress in the manufacture of unit equipment for the Pulp and Paper Industry. Although manufacture of washers, bleachers and other allied equipment had commenced in India even prior to 1960, it was only in 1963-64 that the Indian Machine Building Industry was in a position to offer a wide range of indigenously manufactured unit machines and equipment required by the Indian Pulp and Paper Industry. Today the Indian machine builders cover almost the entire range of unit machines required by the Pulp and Paper Industry and have reached such a stage of development so as to keep the imports for components and raw materials to less than 15% on an average.

This is a very remarkable achievement on the part of the machine building industry and has perhaps gone unnoticed both by the industry and by the Government for want of adequate publicity.

Utkal Machinery Limited (UTMAL) has played a leading role in developing manufacture of such unit machines and equipment in India. I am, therefore, taking this opportunity to inform the distinguished

N. S. Raman,
Utkal Machinery Ltd. Kansbahal,
Orissa.

guests and members of IPPTA, who have collected here for this Seminar, about UTMAL and about its contribution to the Pulp and Paper Industry in this field.

UTMAL was conceived in 1959. Three giant machine building Companies from West Germany-GHH, Koppers and Voith-world leaders in their own fields, decided to join hands with L & T, a leading Indian Engineering Company, to set up a nucleus of machine building industry in India. Collaboration agreements were finalised in 1960 and the construction work of the factory was taken up in hand in 1961. The factory, which is located at Kansbahal near Rourkela, commenced production in 1963.

For the manufacture of Pulp and Paper machinery, UTMAL receives the guidance and know-how from its collaborator, J. M. Voith GmbH of West Germany, who need no introduction,

UTMAL's manufacturing facilities have been specially planned on the basis that manufacture of Pulp and Paper machinery would be one of the major activities of the Company. UTMAL's manufacturing facilities are by and large self-supporting. In other words critical items required in large quantities are manufactured in its own shops. For instance

UTMAL has a well-developed Pattern Shop and Foundry and can meet most of its requirement of sophisticated grey iron, alloy iron, carbon steel, alloy steel as well as non-ferrous castings. Similarly the Fabrication Shop works as a feeder shop to machine and assembly shop and vice versa.

All Shops of UTMAL are served by Railway siding and the heaviest piece of equipment can move in and out of the Shops as also to end-users without any difficulty.

After giving you some background information on UTMAL, about its founder companies and its facilities, I would now deal with the range of unit machines and equipment, which can be supplied by UTMAL to the Pulp and Paper Industry. I may add here that apart from undertaking to supply following unit machines and equipment, UTMAL is in a position to accept and execute orders for the individual sections of the Pulp and Paper plants as also for integrated pulp and paper mills.

Chippers

Chippers are manufactured in 4 unit sizes, one with disc diameter of 1400 mm and others with disc diameters of 2500, 2800 & 3000 mm. These chippers can handle bamboo as well as wood logs.

For chipping of bamboo, chipper of 1400 mm. dia. only can be used. It has a capacity of 5 tons per hour. For wood logs, the capacity would be from 5 tons to 25 tons per hour.

Chip Screens

The size of the Chip Screens presently manufactured is limited to 10 tons per hour.

Rechippers

Drum type rechippers of one size are being manufactured. This chipper could handle 3.5 tons of chips per hour.

Vertical Digesters

Digesters of capacity 60, 80 and 120 m³ can be supplied fully manufactured from the shops. Larger capacity digesters can also be manufactured and supplied but due to transport restrictions in the country, these have to be welded on at site.

Tumbling Digesters

If required, tumbling digesters fully manufactured from the Shops can be supplied in capacities of 25, 30, 35 and 40 m³.

Spherical Digesters

Due to transport restrictions, spherical digesters of diameters upto 4 m. can be supplied.

Blow Tanks

Blow tanks can be supplied for any desired capacity complete with Agitator and its drive.

Knotter Screens

Knotter screens of following capacities are manufactured:

500 N—upto 20 tons/day

1000 N—upto 60 tons/day

Brown Stock Washers

Brown stock Washers in the follo-

wing size ranges are manufactured:

2400 mm dia.—Facelengths upto 2800 mm

3200 mm dia — „ „ „ upto 4000 mm.

The Wash Filters are of valveless design and can be installed at low elevation without any external droplegs or vacuum pumps.

Cleaning Equipment For Pulp Mill

Sand traps for the removal of foreign impurities can be supplied. These can be followed by centrifugal cleaners, which are manufactured in different sizes with rejects regulators.

Washed Stock Screens

The present manufacturing range covers 4 different sizes of Centrifugal Screens and can give production ranging from 20 to 70 tons per day depending upon the pulp characteristics.

For this application pressure screens have also recently been tried successfully in one of the paper mills in India. At present, Screen of size I suitable for a capacity of 30 to 40 tons of pulp per day has been manufactured.

Pressure screens of higher sizes can also be manufactured but have yet to be tried for this application.

Bleach Washers

Same comments as for Brown Stock Washers.

Chest/Tower Propellers

Propellers for both horizontal and vertical chests as also for high density storage and bleach towers and rag stock can be supplied. A very large range of propeller sizes for different applications and chest volumes is available. Couch Pit

Propellers can also be supplied for any desired production and machine widths.

Thickeners

Thickeners of 860 mm, 1250 mm and 1500 mm can be supplied in the face lengths upto 3000 mm.

Conical Refiners

Conical Refiners are manufactured in two sizes-1R and 2R and have power input of 50 to 90 and 100 to 200 kw respectively.

These can be supplied with two different types of tackles i.e. with 0°/6° and 0°/30° bar angles to achieve fibre shortening and also hydration characteristics.

Wide Angle Refiners

These are manufactured in the following four sizes ;

Size	Power input
0 RS	130 kw
1 RS	250 kw
2 RS	400 kw
3 RS	500 kw

Double Disc Refiners

These are manufactured in following three different sizes :

Size	Power input
0 SD	200 kw
1 SD	450 kw
2 SD	800 kw

Beaters

Breaker beaters as well as finishing beaters can be supplied with or without washing drums. The manufacturing range covers beaters suitable for tub capacities ranging from 2000 to 18000 litres,

Rag Pump

A pump of special design suitable for conveying cooked rags from the

spherical digester can be supplied for a capacity of 50 m³ per hour.

Centrifugal Cleaners Ahead Of Head Box

These are manufactured in different sizes for throughputs ranging from 130 to 3000 litres/minute per cleaner. In addition deaeration type cleaners can also be supplied.

These are also manufactured in three different sizes and have a throughput range of 950 to 3000 litres per minute per cleaner.

High Density Cleaners

These are built in two different types

Type 'S' which is built in 3 sizes is normally adopted for treatment of unsorted waste paper.

Type 'N' is built in one size and adopted for cleaning pulp which contains relatively lesser contraries compared to assorted waste paper.

Pressure Screens Ahead Of Head Box

These screens are manufactured in three different sizes and can handle throughputs of upto 400 tons per day per screen.

Vacuum Pumps

A wide range of vacuum pumps having a capacity range of 300 to 20,000 m³/hr air volume (at atmospheric pressure) can be supplied.

An important and special feature of these vacuum pumps is low power consumption even at higher air volumes. Compared to the other conventional pumps, these offer a distinct saving in power costs.

Centrifugal Pumps

A wide range of stock pumps suitable for stock consistency upto 6.5% can be supplied

With 4 or 5 different sizes of centrifugal pumps of open or closed design, the entire pulp and Paper Plant's need can be met meaning thereby interchangeability and lower inventories.

Fan pumps installed ahead of the head box can also be supplied for any desired capacity.

Pulpers

The present manufacturing range covers pulpers from 4 m³ to 60 m³ capacity to handle production upto 240 tons per day. Pulper for treatment of unsorted waste paper with ragger attachment can also be supplied if desired.

Also pulpers for automatic and continuous slushing of broke underneath the Paper Machine can be supplied for different machine widths.

Deflakers

Double disc deflakers in two sizes suitable for production upto 120 tons per day can be supplied.

The deflakers can be equipped with tackle of four different designs to suit specific application of pre-deflaking and final deflaking.

High Consistency Vibration Screens

For screening application after deflaking, the present manufacturing range includes a special type of high consistency screen type 'S' in two sizes suitable to handle throughputs upto 90 tons/day.

Floatation Cells For De-Inking

Floatation cells for deinking of

waste paper can be supplied in suitable groups to handle production of 8 tons/day and above.

Fibre Recovery

For the recovery of fibres from waste water we can manufacture different types of Save-alls such as Floatation Save-alls, Cylinder Mould Filters, Poly-discfilters etc. according to the types of end-products.

Drying Cylinders

Drying Cylinders of 1250 mm dia and 1500 mm dia can be manufactured for face widths upto 4.6 meters without any addition whatsoever to the existing manufacturing facilities. With minor modifications, cylinders upto face width of 5.0 m can be manufactured.

With balancing facilities under planning, initially cylinders upto face width 5.5 m and subsequently upto 7.0 m could be manufactured.

Cylinders can also be manufactured in diameters other than 1250 mm and 1500 mm if required.

Drying Cylinders can either be supplied to own standard designs or customer's designs or to designs based on dimensional parameters specified by end-users.

The cylinders can be supplied with scoops or siphons. The cylinders can be dynamically balanced to the desired degree of accuracy.

Alloyed Cylinders

These cylinders can be manufactured to the same size range as drying cylinders but suitably alloyed so that they can be used for applications after Size Press or as cooling cylinder.

Steam Joints

Steam joints are manufactured in different sizes to suit various requirements.

Pope Reels

As in case of drying cylinders, with the present manufacturing facilities, pope reels suitable for Paper Machines upto wire width of 4.6 meters can be supplied. With minor balancing facilities, this range can be extended for Paper Machines upto 5.0 metres.

Reels can be supplied with hydraulic or pneumatic controls as desired and can take paper roll diameters upto 2200 mm.

With somewhat higher imports, pope reels for any size of Paper Machines can be manufactured and supplied to give paper rolls upto 2500 mm dia.

A list of unit equipment of various types supplied/under supply by UTMAL to various Paper Mills in India is attached to this note for the information of the participants.

Due to shortage of time it has not been possible to compile and place

before the participants the capacity range of other Pulp & Paper Machinery manufacturers in India in the field of unit machines and equipment. It is however hoped that this information would be compiled in due course by the Paper Machinery Manufacturers Association for presentation to the industry and the Government in a suitable form in the near future.

In this context, it may not be out of the way to mention that the paper machinery manufacturing industry, which has developed manufacture of unit machines and equipment in the country, thus reducing country's dependence on imports, is suffering from acute shortage of orders. This is indeed an unfortunate state of affairs, particularly when the capacity has been created and developed at the cost of considerable expenditure and effort.

If this situation continues, some of the machinery manufacturing units would either close down or would be compelled to divert their capacity to other lines of manufacture. The manufacturing know-how and experience so far gained, would thus be lost to the Nation.

While the industry can certainly help by expeditiously releasing as many orders as possible, in my opinion, the Government has an equally vital role to play. Recent instances where large number of unit equipment like refiners, propellers, pumps, screens, cleaners, vacuum pumps, drying cylinders, pope reels etc. have been allowed for import or are being considered for import, are indeed disheartening.

It is difficult to understand and appreciate the constant pressure on the machine building industry by the paper industry as well as by the Government on the one hand to install additional facilities to be able to supply more and bigger Pulp & Paper Plants, and on the other hand when the existing capacity is having a very poor order book, the orders which it can execute are being allowed for import in one form or the other.

It is very much a national problem and it is expected that this would receive the *serious attention it deserves from the Government as well as the industry.*

List of Equipment Supplied and/or Under Supply

Bamboo Chippers (1400 mm Disc Dia.) with Feeding Device.

Sl No	Year of Order	Customer	Qty.	Remarks				
1	1962	Mysore Paper Mills Ltd., Bhadravati	2		4	1967	Bengal Paper Mills Ltd., Ranigunj	1 For woodlogs
2	1964	India Paper Pulp Co. Ltd, Calcutta.	1		5	1967	National Newsprint & Paper Mills Limited, Nepanagar.	1
3	1965	Bengal Paper Mills Ltd., Ranigunj.	2	For woodlogs	6	1969	Western India Match Co Ltd., Calcutta.	1 For woodlogs
					7	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1
					8	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1

Rollers Screens

Sl No	Year of Order	Customer	Qty.	Remarks
1	1967	National Newsprint and Paper Mills Limited, Nepanagar.	2	Bamboo
2	1971	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	Bamboo

Rotary Drum Chippers

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	1	
2	1970	India Paper & Pulp Co. Ltd., Calcutta	1	
3	1971	Titaghur Paper Mill Co. Ltd., Calcutta—1.	1	
4	1972	Titaghur Paper Mill Co. Ltd., Calcutta.	1	

Digesting Plants Inclusive of Liquor Preheater and Other Accessories

1	1966	Star Paper Mills Ltd., Saharanpur.	1	with 85m ³ Digester
2	1967	Seshasayee Paper and Boards Ltd., Erode.	2	with 80 m ³ Digester
3	1967	National Newsprint & Paper Mills Ltd., Nepanagar	3	with 60 m ³ Digester
4	1971	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	1	with 80 m ³ Digester
5	1971	West Coast Paper Mills Ltd., Dandeli.	1	with 80 m ³ Digester.

Spherical Digesters

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	3	4000 mm Ø
2	1969	J. K. Paper Mills, Rayagada.	2	4000 mm Ø

BLOW TANKS

Sl No	Year of Order	Customer	Qty.	Remarks
1	1963	Ashok Paper Mills Ltd., Durbangha.	1	350 m ³ capacity
2	1963	Ashok Paper Mills Ltd., Durbangha.	1	150 m ³ capacity
3	1965	Bengal Paper Mills Ltd., Ranigunj.	1	225 m ³ capacity
4	1965	Rohit Pulp & Paper Mills Ltd., Bombay.	1	44 m ³ capacity
5	1965	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	200 m ³ capacity
6	1966	Star Paper Mills Ltd., Saharanpur.	1	100 m ³ capacity

Blow Heat Recovery System

1	1967	Seshasayee Paper & Boards Ltd., Erode.	1	Complete with Condenser, condensate Filter, Heat Exchangers etc.
---	------	--	---	--

Vibration Screens—500 N/S

1	1966	Star Paper Mills Ltd., Saharanpur.	1	Type 500 N
2	1966	Star Paper Mills Ltd., Saharanpur.	1	Type 500 S
3	1966	Rohtas Industries Ltd., Dalmianagar.	1	Type 500 N
4	1968	Deshbandhu Paper & Board Mill, Bulsar.	1	Type 500 S
5	1970	Bertrams-Scott (India) Ltd., Calcutta.	1	Type 500 S
6	1970	Eastern Paper Mills Ltd., Calcutta.	2	Type 500 N
7	1970	Vikram Paper Mills, Bombay.	1	Type 500 S
8	1970	South India Paper Mills, Nanjangud.	1	Type 500 S
9	1970	Eastend Paper Industries Ltd., Calcutta.	1	Type 500 S
10	1971	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	Type 500 S
11	1972	South India Paper Mills, Nanjangud (Mysore).	1	Type 500 N (under execution.)

Vibration Screens—1000 N

Sl No	Year of Order	Customer	Qty.	Remarks
1	1967	Ratlam Straw Board Mills (P) Ltd., Ratlam.	1	
2	1968	Ratlam Straw Board Mills (P) Ltd., Ratlam.	1	
3	1969	Straw Products Ltd., hopal.	2	
4	1971	J. K. Paper Mills, Rayagada.	1	
5	1971	Straw Products Ltd., Bhopal.	1	under execn.
6	1972	Arvind Board & Peper Products Ltd., Bilimora.	1	under execn.
7	1972	J. K. Paper Mills Rayagada.	1	under execn.
8	1972	J. K. Paper Mills, Rayagada.	1	under execn.

Vacuum Filters—Type VL (Valveless)

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	2	3200 Ø X 3600 face (Concrete Vat)
2	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	2	2400 Ø X 2200 face (Steel Vat)
3	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	1	2400 Ø X 2000 face (Steel Vat)
4	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	1	2400 Ø X 1600 face (Steel Vat)
5	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	3	2400 Ø X 2000 face (Concrete Vat)
6	1969	J. K. Paper Mills, Rayagada.	2	2400 Ø X 1200 face (Concrete Vat)

Sl No	Year of Order	Customer	Qty.	Remarks
7	1969	J. K. Paper Mills Rayagada.	1	2400 Ø X 2400 face (Concrete Vat)
8	1969	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	3200 Ø X 3200 face (Concrete Vat)
9	1969	Mysore Paper Mills Ltd., Bhadravati.	1	2400 Ø X 2400 face (Concrete Vat)

Sand Traps

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	3	
2	1972	J. K. Paper Mills, Rayagada.	1	

Centrifugal Screens—Type ICV, IIC & IICV

1	1966	Shreegopal Paper Mills, Yamunanagar.	3	Type IIC
2	1966	Star Paper Mills Ltd., Saharanpur.	3	Type IIC
3	1967	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	2	Type IIC
4	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	1	Type IIC
5	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	1	Type IICV
6	1970	Mysore Paper Mills Ltd., Bhadravati.	1	Type IIC
7	1970	Punalur Paper Mills, Ltd., Punalur.		Type IIC
8	1970	Punalur Paper Mills, Ltd., Punalur.	2	Type IIC
9	1971	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	2	Type IIC
10	1972	Titaghur Paper Mill Co. Ltd., Calcutta.	2	Type IICV (under execn.)
11	1972	J. K. Paper Mills, Rayagada.	2	Type IICV (under execn.)
12	1972	Ashok Paper Mills, Ltd., Shillong.	3	Type IICV (under execn.)

Chlorine Mixer Size I

Sl No.	Year of Order	Customer	Qty.	Remarks
1	1966	Shreegopal Paper Mills, Yamuna Nagar.	1	

Double Shaft Mixers—Size I & II

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	3	Size II
2	1969	J.K. Paper Mills, Rayagada.	1	size II
3	1969	J.K. Paper Mills, Rayagada.	1	Size I
4	1969	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	Size II

Pulpers—Type V/VS

1	1965	Punalur Paper Mills Ltd., Punalur.	1	V-4 m ³ type
2	1968	Deshbandhu Paper and Board Mill, Bulsar.	1	V-4 m ³ type
3	1969	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	1	V-4 m ³ type
4	1970	Titaghur Paper Mill Co. Ltd., Calcutta.	1	VS-4 m ³ type
5	1970	J. K. Paper Mills, Rayagada.	1	VS-4 m ³ type
6	1970	Titaghur Paper Mill Co. Ltd., Calcutta.	2	VS-4 m ³ type
7	1970	Amaravathi Sri Venkatesa Paper Mills Ltd., Madathukulam.	1	VS-4 m ³ type

Broke Pulper—Type AN—Underneath the Paper Machine

1	1970	J. K. Paper Mills, Rayagada	1	AN-8 m ³ type
---	------	-----------------------------	---	--------------------------

Horizontal Chest Propellers—Type P

Sl No.	Year of Order	Customer	Qty.	Remarks
1	1965	Shreegopal Paper Mills, Yamuna Nagar.	1	Type 1050 P
2	1966	Star Paper Mills Ltd., Saharanpur.	2	Type 1050 P
3	1966	Straw Products Ltd., Bhopal.	2	Type 450 P
4	1967	N.S.P. Straw Products, Bulsar.	1	Type 600 P
5	1967	Rohtas Industries Ltd., Dalmianagar.	1	Type 600 P
6	1967	J.K. Paper Mills, Rayagada.	5	Type 600 P
7	1969	J.K. Paper Mills, Rayagada.	1	Type 700 P
8	1970	Rohtas Industries Ltd., Dalmianagar.	2	Type 600 P
9	1970	Punalur Paper Mills Ltd., Punalur.	2	Type 600 P
10	1970	Punalur Paper Mills Ltd., Punalur.	6	Type 700 P
11	1971	Western India Plywoods Ltd., Baliapatnam.	1	Type 500 P (under execn.)
12	1971	J.K. Paper Mills, Rayagada.	1	Type 700 P
13	1971	J.K. Paper Mills, Rayagada.	1	Type 600 P
14	1972	J.K. Paper Mills, Rayagada.	2	Type 700 P

Vertical Chest Propellers—Type M/MA

1	1966	Sirpur Paper Mills Limited, Sirpur-Kaghaznagar.	12	Type 800 M
2	1967	J.K. Paper Mills, Rayagada.	1	Type 600M
3	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	2	Type 1150M

Sl No	Year of Order	Customer	Qty.	Remarks
4	1969	J.K. Paper Mills, Rayagada.	1	Type 1000 M
5	1969	J.K. Paper Mills, Rayagada.	7	Type 1150 M
6	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Type 850 M
7	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	7	Type 850 M
8	1970	J.K. Paper Mills, Rayagada	1	Type 750 MA
9	1970	J. K. Paper Mills, Rayagada.	3	Type 750 MA
10	1970	Straw Product Ltd., Bhopal.	3	Type 750 MA
11	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	4	Type 850 M
12	1970	Ajanta Paper & General Products Ltd., Kalyan.	1	Type 850 M
13	1971	J. K. Paper Mills, Rayagada.	1	Type 1150 M
14	1972	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Type 850 M (under execn.)
15	1972	J. K. paper Mills, Rayagada.	1	Type 850 M (under execn.)
16	1972	J. K. Paper Mills, Rayagada	1	Type 1000 M (under execn.)

Tower Propellers—Type MB

1	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	6	Type 850 MB
2	1969	Mysore Paper Mills Ltd., Bhadravati.	1	Type 600 MB
3	1969	J. K. Paper Mills, Rayagada.	1	Type 600 MB
4	1969	J. K. Paper Mills, Rayagada.	1	Type 750 MB
5	1969	J. K. Paper Mills, Rayagada.	2	Type 850 MB
6	1970	National Newsprint & Paper Mills Ltd., Nepanagar.	2	Type 850 MB
7	1971	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	Type 600 MB

Horizontal Chest Propeller—Type OB—For Stock Consistency upto 8 Percent :

Sl No.	Year of Order	Customer	Qty.	Remarks
1	1969	J. K. Paper Mills, Rayagada.	4	Type 715 OB
2	1969	J.K. Paper Mills, Rayagada.	1	Type 1045 OB
3	1969	J. K. Paper Mills, Rayagada.	2	Type 880 OB
4	1971	J. K. Paper Mill, Rayagada.	1	Type 715 OB
5	1971	J. K. Paper Mills, Rayagada.	1	Type 880 OB
6	1971	J. K. Paper Mills, Rayagada.	1	Type 1045 OB

Couch pit Propellers

1	1969	J. K. Paper Mills, Rayagada.	1	Size III
---	------	------------------------------	---	----------

High Consistency Purifiers—Type S

1	1966	Eastern Paper Mills Ltd., Calcutta.	1	Type S—1
2	1967	Ratlam Straw Board Mills Ltd., Ratlam.	1	Type S—1
3	1968	Ajanta Paper & General Products Ltd., Kalyan	1	Type S—1
4	1968	South India Paper Mills (P) Ltd., Nanjangud.	1	Type S—1
5	1968	Ballarpur Paper and Straw Board Mills Ltd., Ballarpur.	1	Type S—1
6	1969	Everest Paper Mills (P) Ltd., Calcutta.	2	Type S—1
7	1969	Paper & Pulp Conversions Ltd., Khopoli.	2	Type S—1
8	1969	Straw Products Ltd., Bhopal.	1	Type S—2
9	1970	Punalur Paper Mills Ltd., Punalur.	1	Type S—2
10	1970	Eastern Paper Mills Ltd., Calcutta.	3	Type S—1
11	1970	Eastend Paper Industries Ltd., Calcutta.	1	Type S—1
12	1971	Indian Cardboard Industries, Calcutta.	1	Type S—1
13	1971	Speciality Papers Limited Vapi.	1	Type S—1
14	1971	Amaravathi Sri Venkatesa Paper Mills Ltd., Madathukulam.	1	Type S—1

Refiners—Type 1R & 2R

Sl No	Year of Order	Customer	Qty.	Remarks
15	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Type S—1
16	1972	B.K. Paper Mills Limited., Bombay.	1	Type S—1

High Consistency Purifiers—Type N—1

1	1971	Pudumjee Pulp & Paper Mills Ltd., Poona.	1	
2	1971	J.K. Paper Mills, Rayagada.	1	

Double Disc Deflakers—Type 1E & 2E

1	1966	Shreegopal Paper Mills, Yamuna Nagar.	1	Type 1E
2	1968	Deshbandhu Paper & Board Mill, Bulsar.	1	Type 1E
3	1970	Ajanta Paper and General Products Ltd, Kalyan.	1	Type 1E
4	1970	Punalur Paper Mills Ltd., Punalur.	1	Type 1E
5	1970	Western India Match Co. Ltd., Calcutta.	1	Type 1E
6	1970	Western India Match Co. Ltd., Calcutta.	1	Type 1E
7	1971	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	Type 1E
8	1972	Hyderabad Asbestos Cement Products Ltd, Hyderabad.	1	Type 1E (under execn.)
9	1972	Ashok Paper Mills Ltd., Shillong.	1	Type 1E (under execn.)

Sl No	Year of Order	Customer	Qty.	Remarks
1	1964	Jayant Paper Mills Ltd., Bombay.	2	Type 1R
2	1964	West Coast Paper Mills Ltd., Dandeli.	6	Type 2R
3	1965	Rohtas Industries Limited, Dalmianagar.	4	Type 1R
4	1965	Western India Paper & Boards Ltd., Bombay.	1	Type 1R
5	1965	Paper & Pulp Conversions Ltd., Khopoli.	2	Type 1R
6	1966	Ajanta Paper & General Products Ltd., Kalyan.	1	Type 1R
7	1966	Orient Paper Mills Ltd., Brajrajnagar.	2	Type 1R
8	1966	Star Paper Mills Ltd., Saharanpur.	1	Type 1R
9	1966	Star Paper Mills Ltd., Saharanpur.	2	Type 1R
10	1967	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	Type 2R
11	1967	The Andhra Pradesh Paper Mills Ltd., Rajahmundry.	4	Type 2R
12	1967	Sirpur Paper Mills Ltd., Sirpur-Kagaznagar.	2	Type 1R
13	1967	Rohtas Industries Ltd., Dalmianagar.	4	Type 1R
14	1968	South India Paper Mills Ltd., Nanjangud (Mysore.)	1	Type 1R
15	1969	Paper and Pulp Conversion Ltd., Khopoli.	1	Type 1R
16	1969	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	Type 1R
17	1969	J. K. Paper Mills, Rayagada.	5	Type 2R
18	1969	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	Type 1R

Sl No	Year of Order	Customer	Qty.	Remarks
19	1969	Rohtas Industries Limited Dalmianagar.	3	Type 2R
20	1970	Punalur Paper Mills Ltd., Punalur.	6	Type 1R
21	1970	J. K. Paper Mills Ltd., Rayagada.	2	Type 1R
22	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	10	Type 2R
23	1970	Seshasayee Paper and Boards Ltd., Erode.	2	Type 2R
24	1970	Seshasayee Paper and Boards Ltd., Erode.	2	Type 1R
25	1970	Straw Products Ltd., Bhopal.	1	Type 1R
26	1970	Ajanta Paper & General Products Ltd., Kalyan.	1	Type 1R
27	1970	Rohtas Industries Limited, Dalmianagar.	1	Type 2R
28	1970	Ajanta Paper & General Products Ltd., Kalyan.	2	Type 1R
29	1970	Rohtas Industries Limited Dalmianagar.	1	Type 1R
30	1970	Rohtas Industries Limited Dalmianagar.	6	Type 2R
31	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	4	Type 2R
32	1971	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	2	Type 2R
33	1971	Straw Products Ltd., Bhopal.	2	Type 1R

Thickeners

1	1966	Star Paper Mills Ltd., Saharanpur.	1	1500 mm Ø
2	1966	Shreegopal Paper Mills Yamuna Nagar.	1	1500 mm Ø
3	1967	Star Paper Mills Limited, Saharanpur.	1	1500 mm Ø
4	1969	J. K. Paper Mills, Rayagada.	2	1250 mm Ø
5	1971	J. K. Paper Mills, Rayagada.	1	1250 mm Ø

Sl No	Year of Order	Customer	Qty.	Remarks.
Beaters				
1	1967	Orient Paper Mills Ltd., Brajrajnagar.	1	8000 Lit. (Hollonder)
2	1969	J. K. Paper Mills, Rayagada.	6	10000 Lit. (Invert flow)
3	1969	J. K. Paper Mills, Rayagada	6	18000 Lit. Half stuff with Suction Washing Drums.

Centrifugal Cleaners—Type E/R

1	1966	Star Paper Mills Limited, Saharanpur.	5	200—R
2	1966	Star Paper Mills Limited, Saharanpur.	5	200—R
3	1967	National Newsprint & Paper Mills Ltd., Nepanagar.	22	200—R
4	1969	J. K. Paper Mills, Rayagada.	8	200—E
5	1969	J. K. Paper Mills, Rayagada.	6	200—R
6	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	21	200—R
7	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	6	200—R
8	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	10	200—R
9	1972	J. K. Paper Mills, Rayagada.	11	200—R
10	1972	Ashok Paper Mills Ltd., Shillong.	12	250/2R (under execn.)
11	1972	Ashok Paper Mills Limited, Shillong.	1	200—R (under execn.)

Tube Separators—Size I, II & III

1	1966	Star Paper Mills Limited, Saharanpur.	4	Size II
2	1966	Mysore Paper Mills Ltd., Bhadravati.	5	Size II

Sl No	Year of Order	Customer	Qty.	Remarks	Sl No	Year of Order	Customer	Qty.	Remarks
3	1967	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Size III	14	1970	Delhi Pulp Industries Ltd., New Delhi.	1	
4	1969	J. K. Paper Mills, Rayagada.	1	Size III	15	1970	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	1	
5	1970	West Coast Paper Mills Ltd., Dandeli.	6	Size II	16	1970	Star Paper Mills Ltd., Saharanpur.	1	
6	1970	Rohtas Industries Limited, Dalmianagar.	5	Size II	17	1970	Western India Match Co. Ltd., Calcutta.	1	
7	1972	J. K. Paper Mills, Ravagada.	1	Size II (under execn.)	18	1970	Punalur Paper Mills Ltd., Punalur.	1	
8	1972	J. K. Paper Mills, Rayagada	7	Size II (under execn.)	19	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	
9	1972	J. K. Paper Mills, Rayagada.	1	Size I. (under execn.)	20	1971	Orient Paper Mills Ltd., Brajrajnagar.	2	

Vertical Screens—Size I

1	1965	Paper and Pulp Conversions Ltd., Khopoli.	1	
2	1966	Sirpur Paper Mills Ltd., Sirpur-Kaghaznagar.	2	
3	1966	Sirpur Paper Mills Ltd., Sirpur-Kaghaznagar.	2	
4	1966	Star paper Mills Limited, Saharanpur.	1	
5	1966	Rohtash Industries Limited, Dalmianagar.	3	
6	1966	Jayant Paper Mills Limited, Bombay.	1	
7	1968	Seshasayee Paper & Boards Limited, Erode.	1	
8	1968	Shreegopal paper Mills, Yamunanagar.	3	
9	1969	J. K. Paper Mills, Rayagada	2	
10	1969	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	
11	1970	Punalur Paper Mills Ltd., Punalur.	2	
12	1970	Orient Paper Mills Ltd., Brajrajnagar.	2	
13	1970	Eastend Paper Industries Ltd., Calcutta.	1	

21	1971	Straw Products Ltd., Bhopal.	1	
22	1972	Shreegopal Paper Mills Yamuna Nagar.	1	
23	1972	J. K. Paper Mills, Rayagada.	2	Under execn.
24	1972	Amaravathi Sri Venkatesa Paper Mills, Madathukulam.	1	

Centrifugal Pumps—Type No & NG

1	1964	Orient Paper Mills Limited, Brajrajnagar.	1	
2	1965	J. K. Paper Mills, Rayagada.	1	
3	1965	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	
4	1965	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	6	
5	1966	Star Paper Mills Limited, Saharanpur.	3	
6	1966	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	
7	1966	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	
8	1966	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	

Sl. No.	Year of Order	Customer	Qty.	Remarks
9	1967	Mysore Paper Mills Limited, Bhadravati.	3	
10	1967	West Coast Paper Mills Ltd., Dandeli.	3	
11	1967	Mysore Paper Mills Limited, Bhadravati.	1	
12	1967	Mysore Paper Mills Limited, Bhadravati.	4	
13	1968	J. K. Paper Mills, Rayagada.	1	
14	1968	Star Paper Mills Limited, Saharanpur.	1	
15	1968	Mysore Paper Mills Limited, Bhadravati.	1	
16	1968	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	13	
17	1969	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	3	
18	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	
19	1969	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	8	
20	1969	Mysore Paper Mills Ltd., Bhadravati.	3	
21	1969	J. K. Paper Mills, Rayagada.	40	
22	1969	National Newsprint & Paper Mills Ltd., Nepanagar.	31	
23	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	3	
24	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	
25	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	
26	1969	Rohtas Industries Limited., Dalmianagar.	1	
27	1969	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	14	
28	1970	Straw Products Ltd., Bhopal.	1	
29	1970	Rohtas Industries Limited, Dalmianagar.	1	
30	1970	J. K. Paper Mills, Rayagada.	1	

Sl No	Year of Order	Customer	Qty.	Remarks
31	1970	Star Paper Mills Limited, Saharanpur.	1	
32	1970	Straw Products Ltd., Bhopal.	2	
33	1970	Mysore Paper Mills Ltd., Bhadravati.	1	
34	1970	Rohtas Industries Limited, Dalmianagar.	1	
35	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	
36	1971	J. K. Paper Mills, Rayagda.	3	
37	1971	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	
38	1971	J. K. Paper Mills, Rayagada.	2	
39	1972	J. K. Paper Mills, Rayagada.	2	Under execn.
40	1972	Ashok Paper Mills Ltd., Shillong.	2	Under execn.

Centrifugal Pumps—Type De (Fan Pumps)

1	1967	J. K. Paper Mills, Rayagada.	1	DG 30/35
2	1970	West coast Paper Mills Ltd., Dandeli.	2	DG 30/35
3	1971	Andhra Pradesh Paper Mills Ltd., Rajahmundry.	2	DG 30/35
4	1972	J. K. Paper Mills, Rayagada.	1	DG 30/35 (under execn.)
5	1972	Ashok Paper Mills Ltd, Shillong	1	DG 30/35 (under execn.)

Vacuum Pumps—Type 2 to 15

1	1967	Rohtas Industries Ltd., Dalmianagar.	1	Size 8
2	1959	Rohtas Industries Ltd., Dalmianagar.	1	Size 3a
3	1969	Mysore Paper Mills Ltd., Bhadravati.	1	Size 2
4	1969	Mysore Paper Mills Ltd., Bhadravati.	1	Size 3
5	1969	J. K. Paper Mills, Rayagada.	1	Size 8K
6	1969	J. K. Paper Mills, Rayagada.	7	Size 10K

Sl No	Year of Order	Customer	Qty.	Remarks	Sl No	Year of Order	Customer	Qty.	Remarks
7	1969	J. K. Paper Mills, Rayagada.	3	Size 4	16	1970	Mysore Paper Mills Ltd., Bhadravati.	1	Size 6a
8	1970	Orient Paper Mills Limited, Brajrajnagar.	1	Size 7	17	1971	Bertrams-Scott (India) Ltd., Calcutta.	2	Size 5
9	1970	Orient Paper Mills Limited, Brajrajnagar.	1	Size 5	18	1971	Bertrams-Scott (India) Ltd., Calcutta.	1	Size 7
10	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	2	Size 7	19	1971	Bertrams-Scott (India) Ltd., Calcutta.	1	Size 8K
11	1970	Rohtas Industries Limited Dalmianganar.	1	Size 8	20	1971	Bertrams-Scott (India) Ltd., Calcutta.	1	Size 10K
12	1970	Shreegopal Paper Mills, Yamuna Nagar.	1	Size 10E	Fibre Recovery				
13	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	3	Size 10E	1	1970	J. K. Paper Mills, Rayagada.	1	Floatation type Saveall.
14	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Size 5	2	1970	J. K. Paper Mills, Rayagada.	1	Cylinder mould Filter
15	1970	Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.	1	Size 7					

Utkal Machinery Limited

Head-Box and Wire Section

Kansbahal

Sl No.	Year of Order Receipt	Description of Equipment	Name of the firm
1	1964	2 Flat Suction Boxes 200 mm wide x 4803 mm length.	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
2	1966	1 Wire Stretcher Roll 166 mm ϕ x 4332 mm face.	Star Paper Mills Ltd., Saharanpur
3	1968	30 Table Rolls 4067 mm ϕ x 3175 mm face.	Rohtas Industries Limited, Dalmianagar.
4	1969	12 Table Rolls 150 mm ϕ x 3600 mm face.	Rohtas Industries Limited, Dalmianagar.
5	1969	1 Set of Manifold Pipes for Head Box.	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
6	1969	24 Nose Web Cutting Nozzles.	Rohtas Industries Ltd., Dalmianagar.
7	1969	2 Table Rolls 150 mm ϕ x 3700 mm face.	Orient Paper Mills Ltd., Brajrajnagar.
8	1969	6 Flat Suction Boxes 300 mm wide x 2600 mm long.	Straw Products Limited, Rayagada.
9	1970	1 Flat Suction Box 296 mm wide x 6502 mm face.	Orient Paper Mills Limited, Amlai.
10	1970	1 Slice Lip for Head-box 26.1 mm wide x 1378 mm long.	Ajanta Paper & General Products Pvt. Ltd., Kalyan.
*11	1971	12 Table Rolls 114 mm ϕ x 2953 mm face.	Mysore Paper Mill Ltd., Bhadravati.

*Order under manufacture.

Press Section

Sl No.	Year of Order Receipt	Description of Equipment	Name of the firm
1	1966	Renovation of Press Section	Star Paper Mills Ltd., Saharanpur.
2	1966	1 Paper Roll 250 mm ϕ x 4200 mm face	Star Paper Mills Ltd., Saharanpur.
3	1966	1 Top Press Roll 304.8 mm ϕ x 2395 mm face	Orient Paper Mills Ltd., Brajrajnagar.
4	1966	1 Extractor Press Top Roll 400 mm ϕ x 1916 mm face	Orient Paper Mills Ltd., Brajrajnagar.
5	1969	1 Smoothing Press Roll 750 mm ϕ x 4050 mm face	Orient Paper Mills Ltd., Brajrajnagar.
6	1969	1 Bottom Press Roll 750 mm ϕ x 3700 mm face	The Gwalior Rayon Silk Mfg. (Wvg.) Co. Ltd., Kozhikode.
7	1970	2 Press Rolls 800 mm ϕ x 1600 mm face 700 mm ϕ x 1600 mm face	Western India Plywoods Ltd., Belapatam.
8	1970	6 Copper-covered Felt Carrying Rolls	Straw Products Limited., Bhopal.

End Group

Sl No.	Year of Order Receipt	Description of Equipment	Name of the firm
1	1963	24 Reel Spools 314 mm ϕ x 3850 mm face	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
2	1963	24 Reel Spools 312 mm ϕ x 4760 mm face	The Mysore Paper Mills Ltd., Bhadravati.
3	1963	6 Reel Spools 314 mm ϕ x 4431 mm face	Straw Products Limited., Rayagada.
4	1964	20 Reel Spools 312 mm ϕ x 3650 mm face	The Mysore Paper Mills Ltd., Bhadravati.
5	1965	15 Reel Spools 320 mm ϕ x 4221 mm face	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
6	1966	6 Reel Spools 250 mm ϕ x 3375 mm face	The Mysore Paper Mills Ltd., Bhadravati.
7	1966	6 Reel Spools 317 mm ϕ x 3734 mm face	Star Paper Mills Ltd., Saharanpur.
8	1966	1 Calender Stack with frame of 8 rolls	Star Paper Mills Ltd., Saharanpur.
9	1966	6 Reel Spools 322 mm ϕ x 3366 mm face	Punalur Paper Mills Ltd., Punalur.
10	1967	10 Reel Spools 361 mm ϕ x 3700 mm face	The Andhra Pradesh Paper Mills Ltd., Rajahmundry.
11	1968	10 Reel Spools 316 mm ϕ x 3700 mm face	-do-
12	1969	1 Calender Stack with 6 rolls	Straw Products Limited, Rayagada.
13	1969	1 Complete Pope Reel	-do-
14	1969	6 Reel Spools 400 mm ϕ x 4350 mm face	-do-
*15	1970	1 Camber Bar 150 mm ϕ x 4075 mm face	Rohtas Industries Ltd., Dalmianagar.

* Order under manufacture.

Dryer Section

Sl No	Year of Order Receipt	Description of Equipment	Name of the firm
1	1963	1 Vapour Hood	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
2	1964	5 Drying Cylinders 1524 ϕ x 3490 mm face	India Paper Pulp Co. Ltd., Calcutta.
3	1964	2 Automatic Felt Guides	The Titaghur Paper Mills Co. Ltd., Calcutta.
4	1965	3 Drying Cylinders 1251 ϕ x 2946 mm face	Eastern Paper Mills Ltd., Calcutta.
5	1966	1 Vapour Hood	State Paper Mills Ltd., Saharanpur.
6	1966	Complete After-Dryer Section consisting of 4 cylinders of 1524 mm ϕ x 4115 mm face	State Paper Mills Ltd., Saharanpur.
7	1966	12 Nos. Felt Carrying Rolls 275 mm ϕ x 4460 mm face	Sirpur Paper Mills Ltd., Sirpur-Kaghaznagar (A.P.).
8	1966	1 Drying Cylinder 1500 ϕ x 2300 mm face with bush bearing, steam joint and drive gear	Straw Products Limited, Bhopal.
9	1968	15 Drying Cylinders 1500 x 3620 mm face	The Andhra Pradesh Paper Mills Ltd., Rajahmundry.
10	1968	3 Drying Cylinders 1524 ϕ x 1780 mm face	Everest Paper Mills Pvt. Ltd., Calcutta.
11	1969	Complete Dryer Section consisting of: 19 Drying of 1500 ϕ 4100 mm face 1 Sweat Dryer 1500 ϕ x 4100 mm face of alloyed cast iron 9 Felt Dryers of 1250 mm ϕ x 4100 mm face 64 Felt Rolls of 269 ϕ x 4300 mm face 10 Felt Stretchers 1 Vapour Hood etc.	Straw Products Ltd., Rayagada.
12	1969	15 Steam Joints	Rohas Industries Ltd., Dalmianagar.
13	1970	2 Drying Cylinders 1220 ϕ x 2135 mm face	The South India Paper Mills Ltd., Nanjangud (Mysore State).
*14	1970	1 Suction Couch Roll 820 ϕ x 4230 mm face	The Ballarpur Paper & Straw Board Mills Ltd., Ballarpur.
15	1970	4 Drying Cylinders 1500 mm ϕ x 1905 mm face	N.S.P. Straw & Paper Products Pvt. Ltd., Bulsari.

*Orders under manufacture.

Sl. No.	Year of Order Receipt	Description of Equipment	Name of the firm
*16	1970	8 Drying Cylinders 1500 \emptyset x 1900 mm face	Eastend Paper Industries Ltd., Calcutta.
17	1970	9 Steam Joints.	Mysore Paper Mills Ltd., Bhadravati.
*18	1970	13 Drying Cylinders 1220 mm \emptyset x 2100 mm face.	Amaravathi Sri Venkatesa Paper Mills Ltd., Udamalpet (Tamil Nadu).
19	1970	1 Alloyed Cast-iron Drying Cylinder 1067 mm \emptyset x 3175 mm face.	Tribeni Tissues Limited., Dist. Hooghly.
20	1970	13 Steam Joints.	Amaravathi Sri Venkatesa Paper Mills Ltd., Udamalpet (Tamil Nadu).
*21	1970	13 Drying Cylinders 1500 mm \emptyset x 3585 mm face.	The West Coast Paper Mills Ltd , Dandeli
*22	1970	14 Drying Cylinders (4 Nos. 1371.6 mm \emptyset 3537 mm face 1 No. 1371.6 mm \emptyset 2978 mm face 2 Nos. 1220 mm \emptyset 2590 mm face 4 Nos. 1220 mm \emptyset 2572 mm face 1 No. 1220 mm \emptyset 2562 mm face 2 Nos. 1524 mm \emptyset 3052 mm face)	The Titaghur Paper Mills Co. Ltd., Calcutta.
*23	1971	1 Steam Joint for MG Cylinder	Rohtas Industries Ltd., Dalmianagar.
*24	1972	1 Drying Cylinder 1524 mm \emptyset x 4115 mm face 2 Drying Cylinders 1372 mm \emptyset x 2900 mm face	Star Paper Mills Limited, Saharanpur.

* Orders under manufacture.

Utkal Machinery Limited

Kansbahal

Mechanical Parts for Drive of Paper Machine

Sl No.	Year of Order Receipt	Description of Equipment	Name of the firm
1	1965	19 Taper Pulleys.	Straw Products Limited, Rayagada.
2	1969	One complete set of mechanical parts for Paper machine drive.	—do—