

**MODEL OF THE MONTH**

# Cloth Folding Machine

**T**HE Thread Twisting and Knopping Machine featured in the September *M.M.* proved an exceptionally popular model, and many readers have written to ask for models of more of the fascinating machines used in the preparation and finishing of cloth. To meet these requests this month we turn again to the textile industry for our subject for the "Model of the Month."

The Cloth Folding Machine shown in the pictures on these pages differs from the textile machine we have described previously in that it is not used in the actual making of cloth. It is a machine designed to carry out the folding of finished lengths of cloth into convenient bales ready for distribution.

Most readers will be familiar with the bales of cloth displayed by drapers and tailors, which have to be unrolled in order to cut off the lengths of cloth required by customers. The cloth to be folded in the warehouses

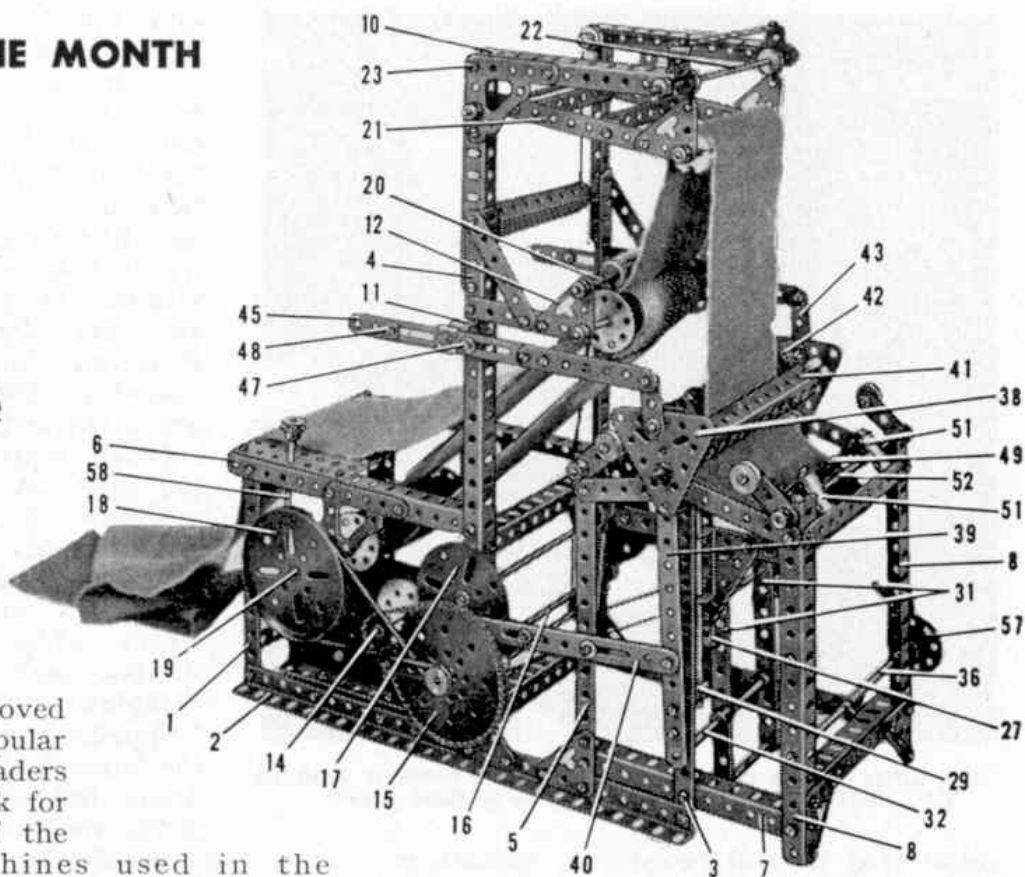


Fig. 1. An attractive machine for folding completed cloth into bales ready for despatch from the mills to the customer.

of textile manufacturers is in lengths of approximately 60 yards, and our model is based on a special machine that has been developed to carry out the job quickly and conveniently. The machine folds the cloth concertina fashion, which

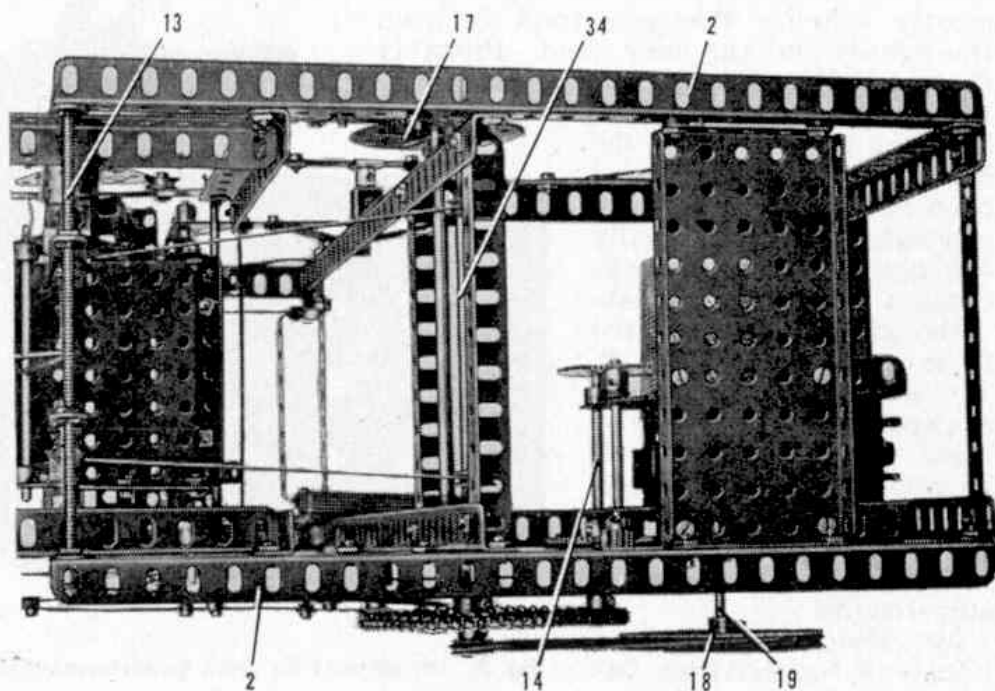


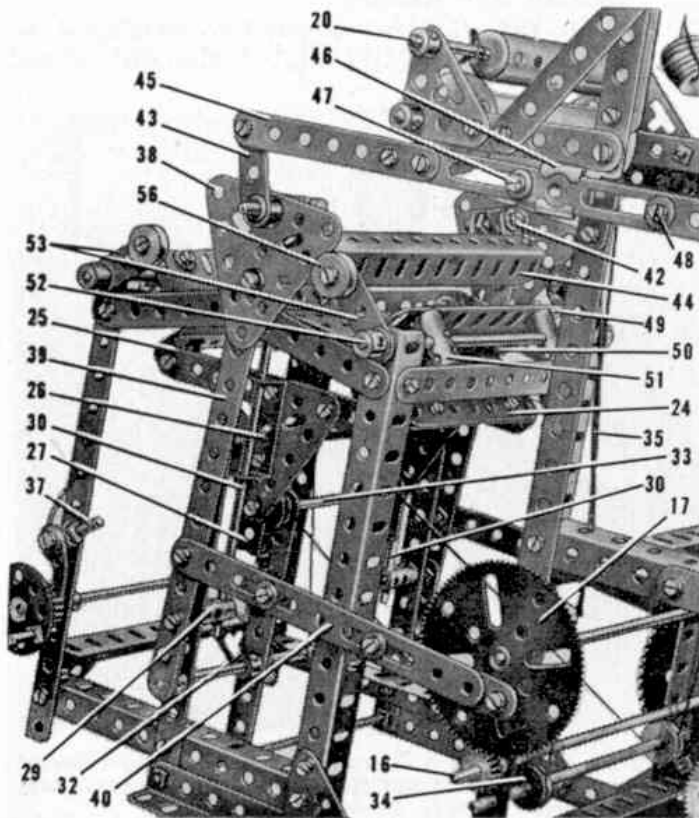
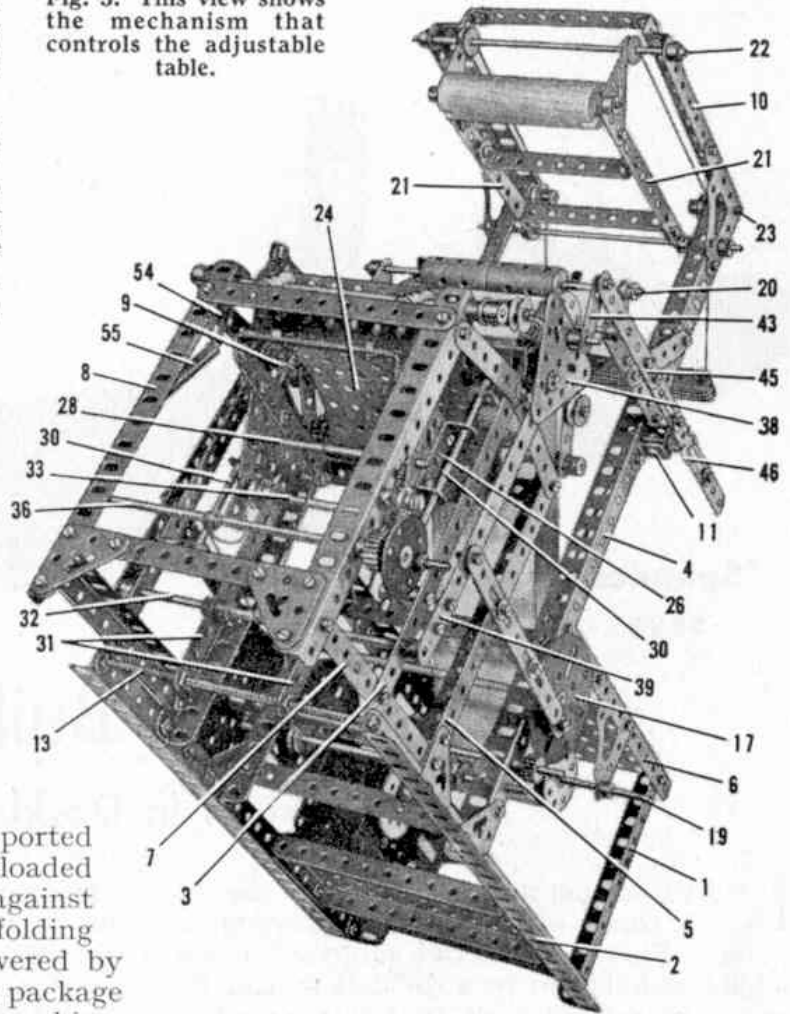
Fig. 2. An underneath view of the Cloth Folding Machine.

allows it to be unfolded and cut to required lengths much more easily than is the case in a bale of cloth rolled round a board.

The folding is carried out very quickly, a length of 60 yards of cloth being completed in less than five minutes, and the resulting bale forms a neat, almost square package that is easy to handle. These packages are wrapped in paper for delivery in this country, or are boxed in crates for despatch overseas.

The model carries out the essential movements of the actual machine, and it is exceptionally interesting to watch in action. The folding mechanism is operated by levers, which are actuated by cranks driven by an E20R(S) Electric Motor. Once the cloth has been fed into the machine and the Motor switched on, the action is automatic until the complete length of cloth is folded. The folded cloth is supported on a specially shaped spring-loaded table, which presses the material against the operating bars of the folding mechanism. The table can be lowered by operating a hand wheel, so that the package of cloth can be withdrawn from the machine.

Fig. 3. This view shows the mechanism that controls the adjustable table.



The action of the Cloth Folding Machine is fascinating to watch, yet the machine itself is comparatively simple to assemble and it is easy to adjust the mechanism. There is sure to be a big demand for details of this model, so make sure of obtaining your copy of the instructions by writing for them now. The instructions contain full constructional details of the Cloth Folding Machine and a list of the parts required to build it, and they can be obtained by writing to the Editor enclosing a 2d. stamp for postage.

Readers living in Canada, Australia, New Zealand, South Africa and Ceylon can obtain copies of the instructions for the *current* "Model of the Month" by writing to the main Meccano Agents for those countries, enclosing suitable stamps for return postage.

Fig. 4. Most of the main operating mechanism of the Cloth Folding Machine is seen in this side view.

CLOTH FOLDING MACHINE

Illustrated in the February 1957 issue of the "Meccano Magazine"

Construction of the Frame

Each side of the frame is made by bolting a  $5\frac{1}{2}$ " Angle Girder 1, a  $7\frac{1}{2}$ " Strip 3, a girder 4 made from a  $12\frac{1}{2}$ " and a  $5\frac{1}{2}$ " Angle Girder overlapped four holes, and a  $7\frac{1}{2}$ " Angle Girder 5 to a  $12\frac{1}{2}$ " Angle Girder 2. The Girders 4 and 5 are braced by  $1\frac{1}{2}$ " Corner Brackets. A  $7\frac{1}{2}$ " Angle Girder 6 is bolted between the Girders 1 and 4 as shown, and a  $5\frac{1}{2}$ " Angle Girder 7 is fixed to the Girder 5 and the Strip 3, and this supports a  $7\frac{1}{2}$ " Angle Girder 8. A 3" Strip is bolted in the next to top hole of each of the Girders 5 and 8, and the other ends of these Strips are connected to Strip 3 by a  $\frac{3}{8}$ " Bolt. The Bolt secures also an Angle Bracket 9, which is spaced from the Strips by five Washers. A  $5\frac{1}{2}$ " Angle Girder 10 is connected to the upper end of girder 4 and is strengthened by a Corner Gusset. A Double Bent Strip 11 and a  $3\frac{1}{2}$ " Strip that supports a  $1\frac{1}{2}$ " Corner Bracket 12 are attached to the girder 4, and a 3" Strip is bolted between girder 4 and the  $3\frac{1}{2}$ " Strip to brace the assembly.

The two sides of the frame are connected by  $5\frac{1}{2}$ " Angle Girders and Strips, a  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate, a  $5\frac{1}{2}$ " x  $3\frac{1}{2}$ " Flat Plate and a 6" Screwed Rod 13.

Driving Mechanism.

An E20R(S) Electric Motor is bolted to the  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate and a  $7/16$ " Pinion is fixed on its armature shaft. This Pinion drives a 60-tooth Gear on a  $2\frac{1}{2}$ " Rod mounted in the Motor side-plates, and a  $7/16$ " Pinion on the same Rod meshes with a 60-tooth Gear on a  $3\frac{1}{2}$ " Rod 14. Rod 14 is supported in the Motor side-plates and it carries a  $\frac{5}{8}$ " Sprocket placed outside the frame of the model. This Sprocket is connected by Chain to a 3" Sprocket 15 on an 8" Rod 16 mounted in the girders 4. Two  $\frac{1}{2}$ " Pinions on Rod 16 drive two  $2\frac{1}{2}$ " Gears 17 set with their slots exactly in line on a  $6\frac{1}{2}$ " Rod, which is supported in the girders 4.

Rod 16 carries a  $\frac{1}{2}$ " fixed Pulley connected by a crossed Driving Band to a 3" Pulley 18 on an 8" Rod 19. This Rod is fitted with a Wood Roller held in place by two Bush Wheels, and it is mounted in Corner Gussets bolted to the Girders 6. A second Wood Roller and two Bush Wheels are placed on a  $6\frac{1}{2}$ " Rod supported in the end holes of the  $3\frac{1}{2}$ " Strips and the Corner Brackets 12. The two Rollers should be connected by an endless belt made from thin rubber, flexible emery cloth or brown paper. This belt helps to feed the cloth into the machine and keeps it clear of the operating mechanism. A guide roller on a  $6\frac{1}{2}$ " Rod 20 is made from two Sleeve Pieces and three Chimney Adaptors.

An End Bearing is lock-nutted to an arm of the Motor switch, and a  $4\frac{1}{2}$ " Rod 58 held in it is passed through the frame and is fitted with a  $\frac{1}{2}$ " fixed Pulley at its upper end.

Details of the Balancing Roller

Two  $5\frac{1}{2}$ " Strips 21 are connected by two  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips, with a Washer on each of the bolts to space the Strips further apart, and a  $1\frac{1}{2}$ " Corner Bracket is bolted to each Strip. The Strips

pivot on a Rod held in the girders 4 by Collars, and a Wood Roller is mounted freely on a Rod supported in the Strips. Two  $\frac{1}{2}$ " loose Pulleys are placed on a Rod 22, and two similar Pulleys are mounted on Adaptors for Screwed Rods attached by bolts 23. The Pulleys are held in place by Collars. A length of Cord is tied to each Corner Bracket, is passed over the Pulleys and is fastened to a balance weight formed by 15  $4\frac{1}{2}$ " Strips.

#### Adjustable Table.

A  $5\frac{1}{2}$ " x  $3\frac{1}{2}$ " Flat Plate 24 is curved to a 6" radius and a  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip is bolted to each end of it. The Double Angle Strips are connected by  $4\frac{1}{2}$ " Strips 25, each of which supports a  $2\frac{1}{2}$ " Triangular Plate. A  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 26 is bolted to the outer face of each Triangular Plate and a  $1$ " x  $\frac{1}{2}$ " Angle Bracket 27 is fixed to the inner face. A  $4$ " Rod 28 is held in the Triangular Plates by Collars. A Threaded Coupling 29 is screwed on to a bolt passed through each of the Strips 3, and a  $5$ " Rod 30 on each side is held in the Threaded Coupling and in the Angle Bracket 9. The Double Angle Strips 26 must slide freely on the Rods 30.

Two  $4\frac{1}{2}$ " Strips 31 are fixed by nuts on the Screwed Rod 13 and are held between Collars on a  $6\frac{1}{2}$ " Rod 32. These Strips support a  $3$ " Rod 33 fitted with two  $\frac{1}{2}$ " fixed Pulleys. A length of Cord is tied to each of the Angle Brackets 27, is passed over one of the Pulleys on Rod 33 and under a  $\frac{1}{2}$ " loose Pulley on a Rod 34 mounted in the girders 4. The Cord is tied to a  $6$ " Driving Band 35, which is stretched slightly and is looped over a  $\frac{1}{2}$ " Bolt in one of the girders 4. These Driving Bands pull the table to its highest position.

The table can be lowered by turning a Rod 36, which has a handle formed by a Threaded Pin in a Bush Wheel. Cord tied to a Cord Anchoring Spring on Rod 36 is passed under Rod 32 and is fastened to Rod 28. A Pawl engages a Ratchet Wheel on Rod 36 and is held in engagement by a short piece of Spring Cord arranged as shown. A Threaded Pin 37 in the Pawl, which is mounted on a Pivot Bolt, forms a release handle.

#### The Folding and Locking Mechanism

At each side a  $2\frac{1}{2}$ " Triangular Plate 38 is attached to a  $7\frac{1}{2}$ " Strip 39, which is fixed to a Crank on the end of Rod 32. Two  $5\frac{1}{2}$ " Slotted Strips 40 are connected together by bolts through their slotted holes and are lock-nutted to the Strip 39 and to the Gear 17. The Slotted Strips on each side must be adjusted to exactly the same length. A  $1\frac{1}{2}$ " Rod is passed through each of the Triangular Plates 38 and is fitted with a large Fork Piece 42 and a Crank 43. Two Obtuse Angle Brackets are fixed to the lugs of each Fork Piece and these support  $5\frac{1}{2}$ " Angle Girders 41 and 44. A built-up strip 45, made from a  $3\frac{1}{2}$ " Strip and a  $5\frac{1}{2}$ " Slotted Strip, is lock-nutted to Crank 43 and is passed through a Slide Piece 46. The Slide Piece is fixed on a  $1\frac{1}{2}$ " Rod mounted in the girder 4 and in Double Bent Strip 11. Bolts 47 and 48 in the strip 45 serve as stops and limit the sliding movement of the strip.

A  $3\frac{1}{2}$ " Rack Strip 50 is bolted to a  $4\frac{1}{2}$ " Flat Girder 49, which is attached by bolts to two Threaded Couplings 51 on a Rod 52. Each end of Rod 52 is fitted with a Crank 53, which carries a  $\frac{1}{2}$ " loose Pulley 56 on a  $\frac{3}{8}$ " Bolt. A Crank 54 is fixed on Rod 52 inside the frame, and a Tension Spring 55 attached to the Crank is stretched slightly and is bolted to the Girder 8. The cloth locking assembly described above is duplicated at each end of the cloth folding table.

#### Adjusting the Machine

The mechanism should be adjusted with a length of cloth in

position. Turn the Gears 17 towards the rear. As the Triangular Plate 38 bears against the Pulleys 56 it will start to raise the mechanism that holds the cloth on the table, and the Angle Girder 44 will turn upward. The mechanism must be set so that when strip 45 is prevented from moving by the bolt 47, the Girder 41 passes under the Rack Strip 50 of the inner locking assembly. As the Gears 17 are rotated the Angle Girder 41 will be drawn from underneath the Rack Strip 50, just as the Spring 55 returns the mechanism to press the Rack Strip against the cloth. Care must be taken to prevent the Girders 41 and 44 from touching the Rack Strips.

Operation of the Model

A length of cloth 3" wide should be used. It is passed between the feeding rollers, over the balancing roller and between the Angle Girders 41 and 44. The cloth is led over one end of the table and is clamped in place by the Rack Strip 50 at the same end. When the machine is set in motion the cloth will be carried to each end of the table alternately by the Angle Girders 41 and 44. At each end the Rack Strip 50 is raised by the mechanism to allow the cloth to pass beneath it, and then returns to clamp the cloth in place as the Girders 41 and 44 return to the opposite end of the table. To remove the cloth from the machine after folding, the table is lowered by operating the hand wheel 57.

PARTS REQUIRED

4 of No. 1b	5 of No. 24	1 of No. 94
5 " " 2	2 " " 26	1 " " 95b
20 " " 2a	2 " " 26c	1 " " 96a
4 " " 3	2 " " 27c	2 " " 103c
6 " " 4	2 " " 27d	3 " " 106
4 " " 8	6 " " 35	4 " " 108
6 " " 8b	166 " " 37a	2 " " 110
13 " " 9	144 " " 37b	4 " " 111a
2 " " 12	64 " " 38	10 " " 111c
2 " " 12b	1 " " 40	2 " " 115
4 " " 12c	2 " " 43	2 " " 116
2 " " 13a	2 " " 45	2 " " 125
10 " " 14	2 " " 48	10 " " 133
2 " " 15	4 " " 48b	1 " " 147
2 " " 15a	2 " " 50	1 " " 148
1 " " 15b	1 " " 52	2 " " 163
1 " " 16	2 " " 52a	4 " " 164
1 " " 16a	6 " " 55	1 " " 166
1 " " 16b	1 " " 58	2 " " 173a
2 " " 18a	29 " " 59	1 " " 176
2 " " 18b	10 " " 62	2 " " 186a
1 " " 19b	6 " " 63c	1 " " 186c
10 " " 23	4 " " 76	1 E2OR(S) Electric Motor.
4 " " 23a	1 " " 79a	