No. 720,081. PATENTED FEB. 10, 1903.

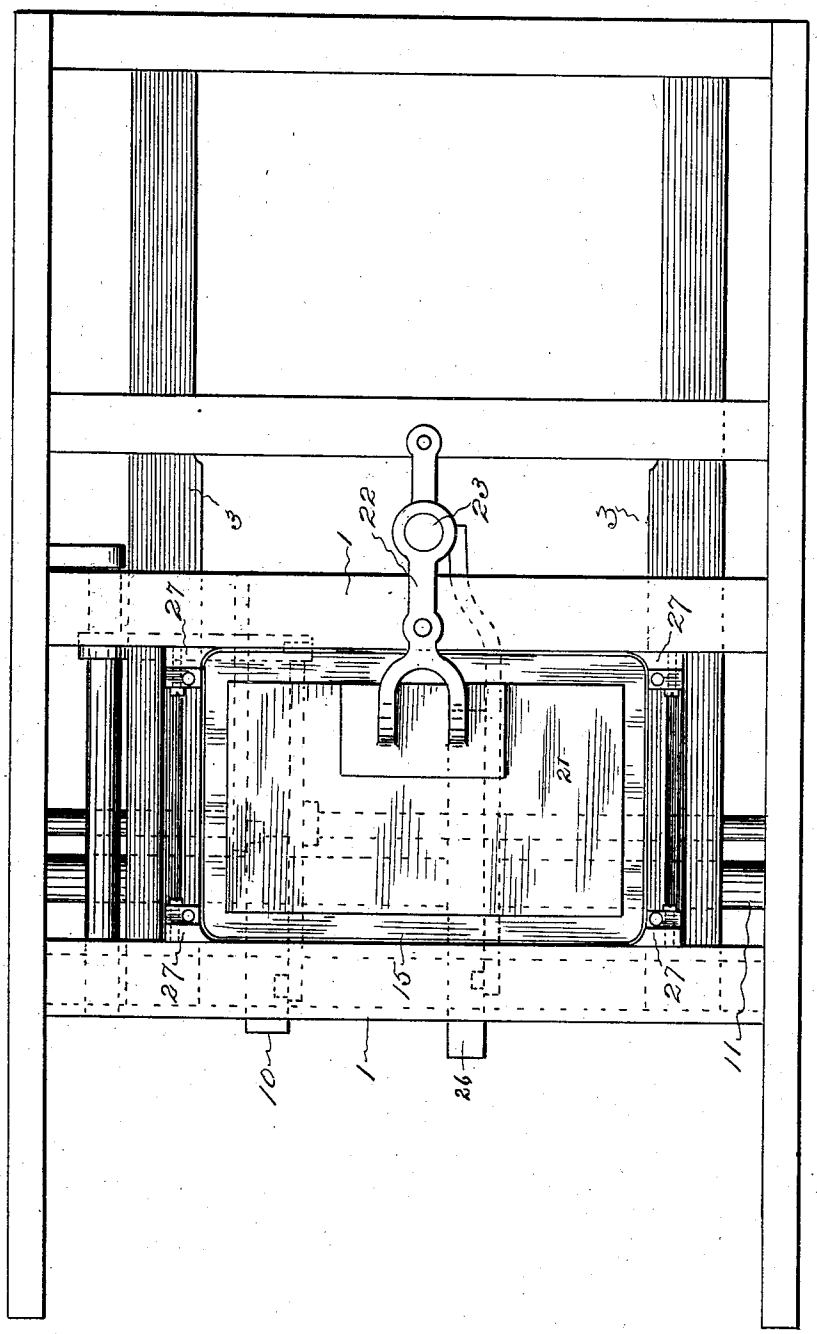
F. D. TAYLOR.

CLOTH FOLDING MECHANISM.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL. 5 SHEETS—SHEET 1.

Fig. 1



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Attorney

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NO MODEL. 5 SHEETS—SHEET 2.

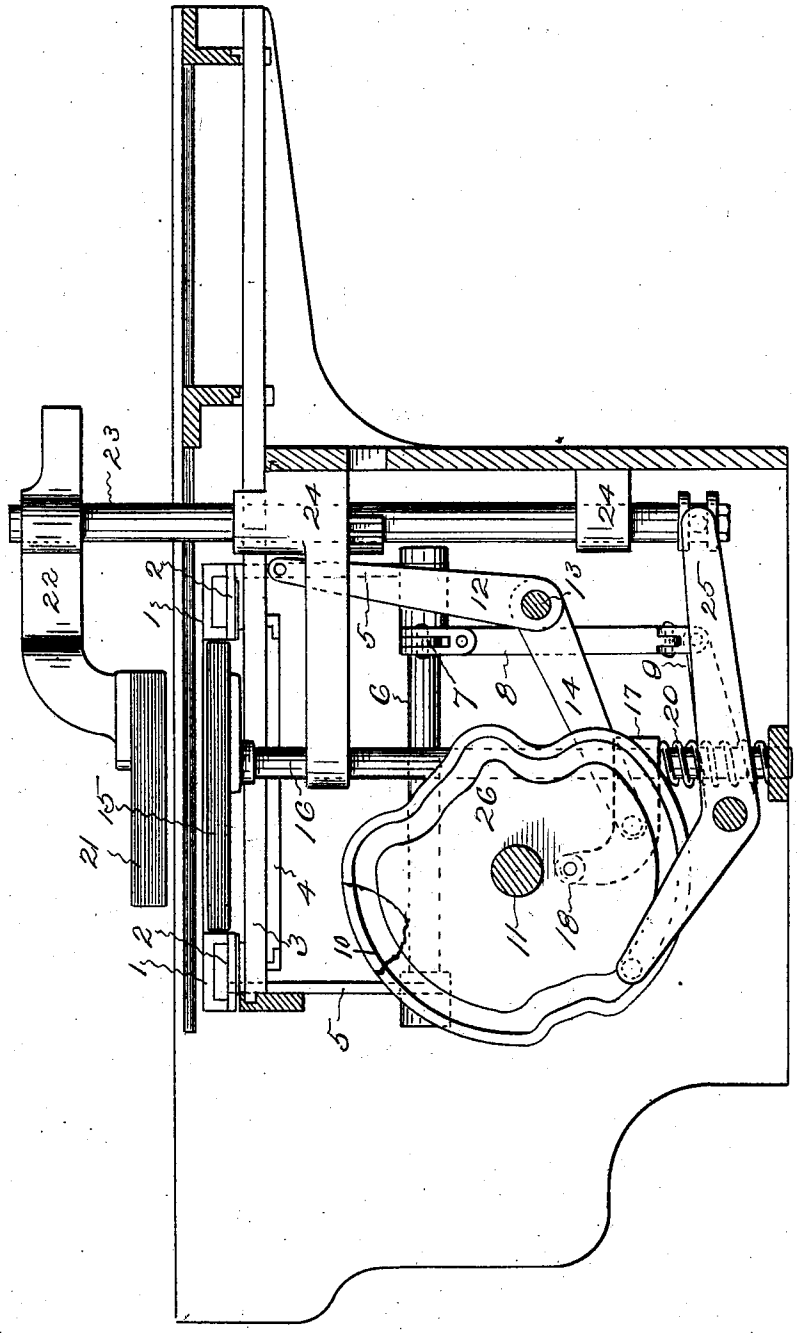

Fig. 2.

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NO MODEL. 5 SHEETS—SHEET 3.

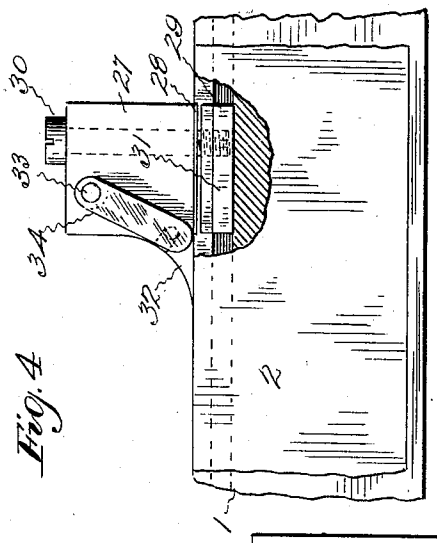

Fig. 4

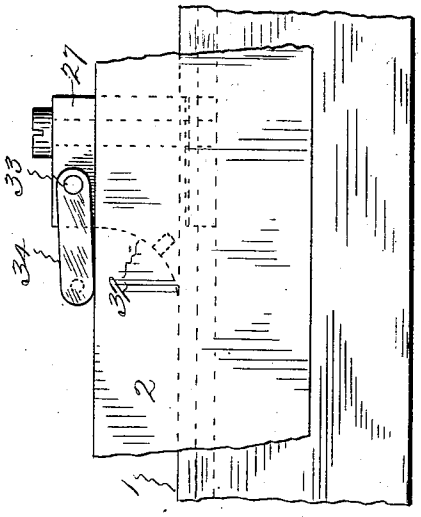

Fig. 5

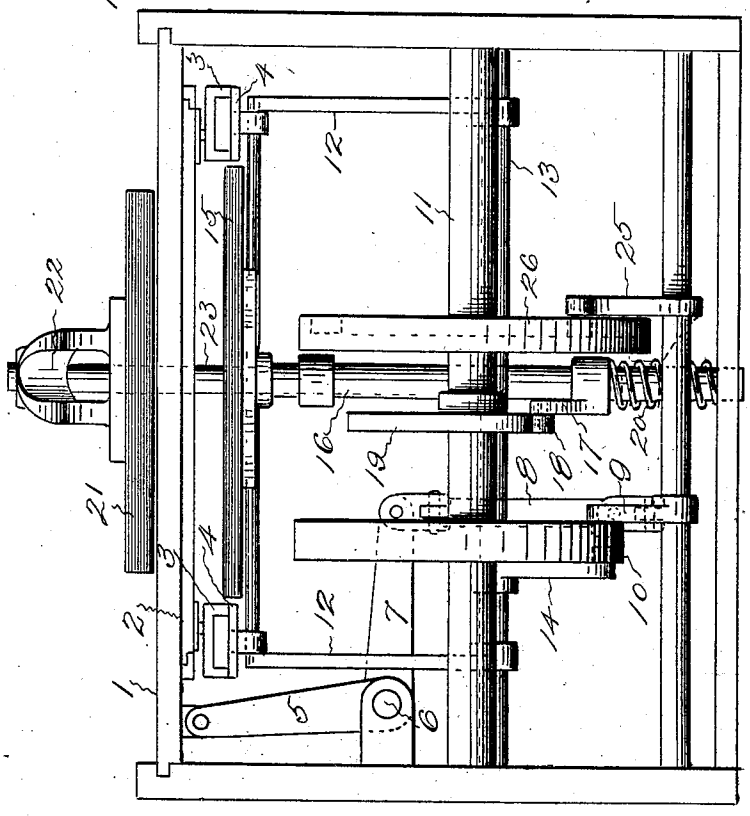

Fig. 3

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NO MODEL. 5 SHEETS—SHEET 4.

Fig. 8

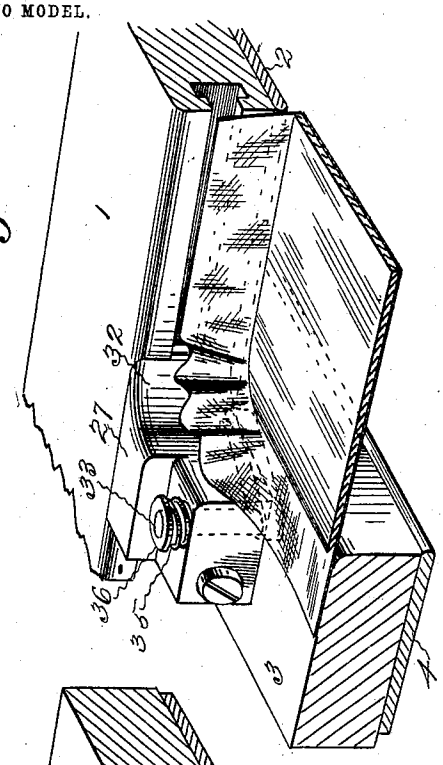


Fig. 9

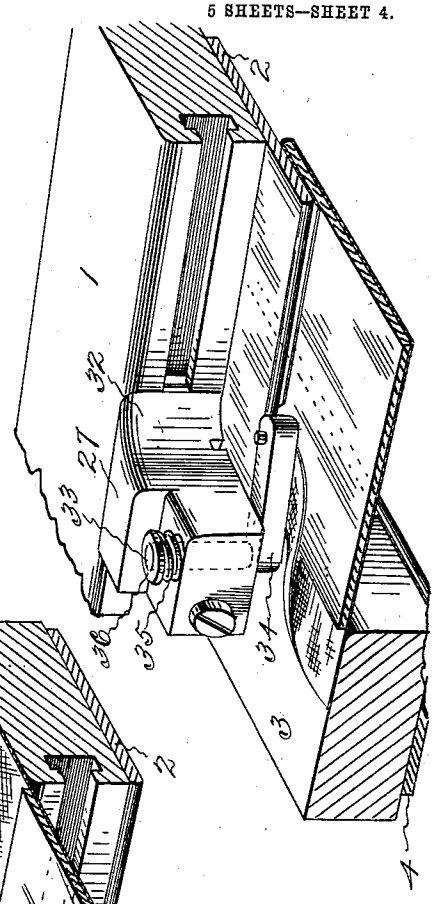


Fig. 6.

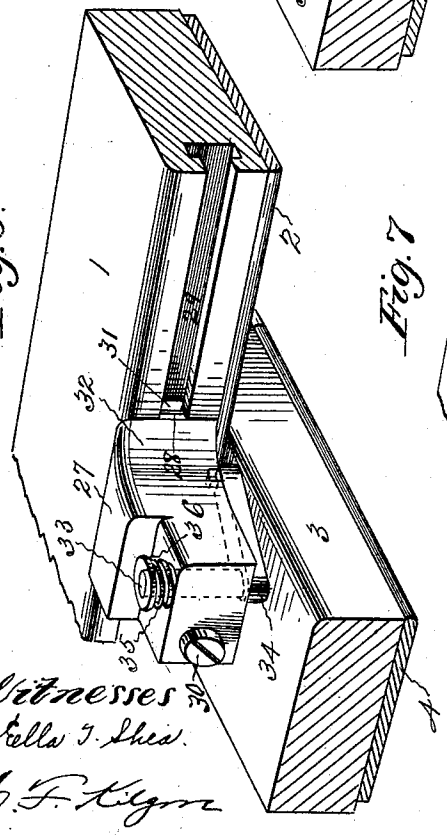
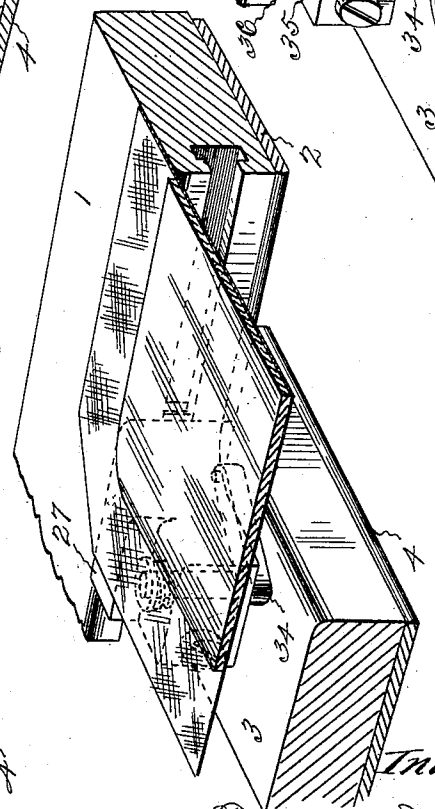


Fig. 7



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No. 720,081. PATENTED FEB. 10, 1903.

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CLOTH FOLDING MECHANISM.

APPLICATION FILED SEPT. 15, 1902.

NO MODEL. 5 SHEETS—SHEET 5.

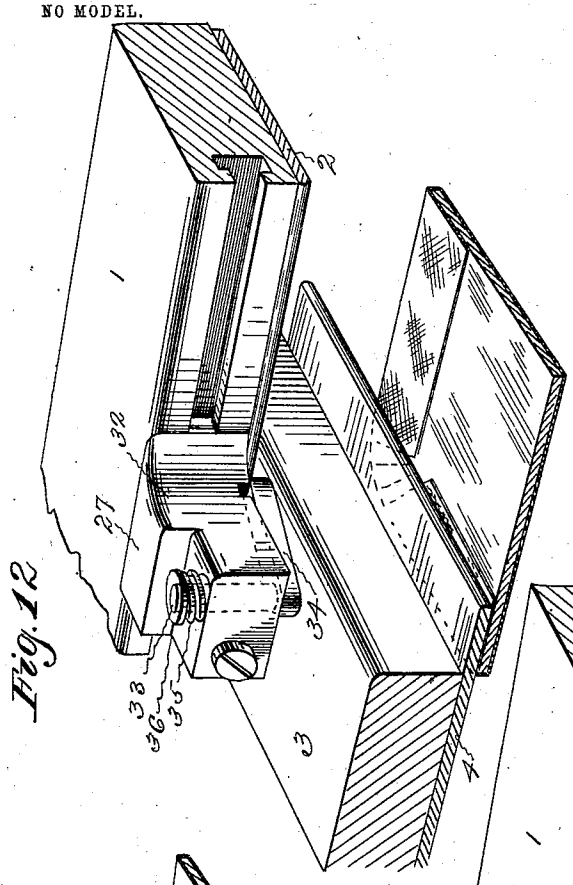

Fig. 12

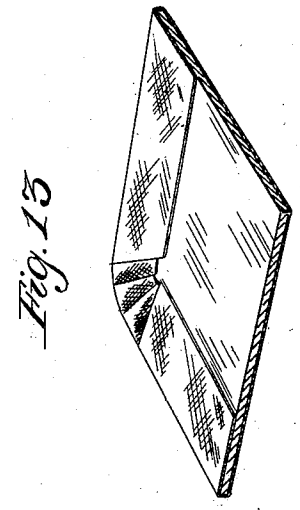

Fig. 13

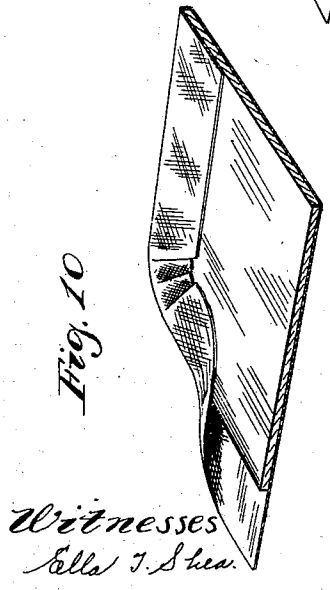

Fig. 10

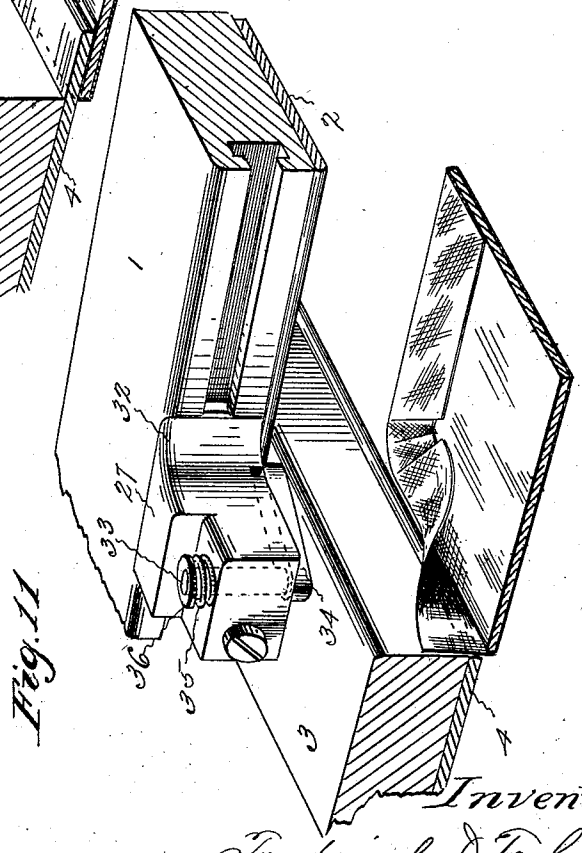

Fig. 11

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UNITED STATES PATENT OFFICE.

FREDERICK D. TAYLOR, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE SMYTH MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

CLOTH-FOLDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 720,081, dated February 10, 1903.

Application filed September 15, 1902. Serial No. 123,405. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D. TAYLOR, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Cloth-Folding Mechanism, of which the following is a specification.

United States Letters Patent No. 513,453, dated January 23, 1894; No. 580,111, dated April 6, 1897, and No. 661,763, dated November 13, 1900, show machines for making cases for books, having mechanisms which fold the edges of glued sheets of cloth over the edges of boards and backs. The machines of these patents so fold the cloth about the boards that the cases produced have square corners.

The object of this invention is to provide a simple mechanism for use with machines of this nature whereby the cloth may be successfully folded over boards having round corners and produce round-cornered cases.

This invention consists of corner-blocks adapted to be formed a part of or adjustably attached to folder-bars of the machine. Each block has a concave surface designed to hold the cloth to the round corner of a board and carries a finger in the path of the folding-blade that makes the first fold of the cloth over the edge of the board. The finger is moved by the folding-blade and swings on the arc of a circle in such a manner as to lay down the corner-folds of the cloth in advance of the folding of the cloth by the folding-blade, so that the cloth which is folded down by the folding-blade lies over the corner-section that has been wiped down by the finger.

Figure 1 of the accompanying drawings shows a plan of the frame, the supporting-table, the platen, and the folder-bars of a case-forming machine provided with the round-corner folders. Fig. 2 is a side elevation of the mechanisms shown in Fig. 1, the frame being cut in section. Fig. 3 is a front elevation of these mechanisms. Fig. 4 is a view, on larger scale, of the under side of a portion of a folding-blade and a round-corner folder. Fig. 5 is a similar view with the folding-blade moved forwardly and the round-corner folding finger pushed out by the blade. Fig. 6 is a perspective view showing the relative positions of two of the folder-bars and a round-corner folder. Fig. 7 is a similar view with a piece of cloth and board in the positions occupied before they are pressed down to turn up one edge of the cloth. Fig. 8 is a similar view with the piece of cloth and board in the positions occupied when they have been pressed down and one edge of the cloth is turned up. Fig. 9 is a similar view with the folding-blade moved forwardly for folding over the first edge of the cloth, the round-corner-folding finger being shown in advance of the blade. Fig. 10 is a view of the piece of board and cloth as it appears after the operation illustrated by Fig. 9. Fig. 11 is a perspective view showing the piece of board and cloth in the positions occupied just before the side edges of the cloth is folded down. Fig. 12 is a similar view showing the positions of the board and cloth after the folding-blade has folded the cloth down over the side edge, and Fig. 13 is a perspective view of a corner of a case formed on a machine with these round-corner folders.

The upper folder-bars 1, that extend transversely, are adjustably fixed to the frame of the machine in one plane and support the movable blades 2, that fold the edges of the cloth over the top and bottom edges of the boards and backs. The lower folder-bars 3, that extend longitudinally, are adjustably fixed to the frame below the upper bars and support the movable blades 4, that fold the edges of the cloth over the side edges of the boards. The upper folding-blades at the proper time are moved out from beneath the upper bars toward each other to fold the edges of the cloth over the upper and lower edges of the boards and backs by rocker-arms 5 on a shaft 6, that has a rocker-arm 7, which is connected by a link 8 with a lever 9, that is oscillated by a cam-groove in one face of the cam-disk 10 on a cam-shaft 11, which is driven by any suitable mechanism, Figs. 2, 3. The lower folding-blades at the proper time are moved out from beneath the lower bars toward each other to fold the edges of the cloth over the side edges of the boards by rocker-arms 12 on a shaft 13, that has a lever 14 en-

gaging a cam-groove in a face of the cam-disk 10, Figs. 2, 3.

The table 15, that is movable vertically between the folder-bars, is mounted on a post 16, that has an arm 17, with a stud 18 in engagement with the cam 19 on the cam-shaft. A spring 20 tends to lift the post and table and hold the arm-stud in engagement with the cam, Fig. 3. A vertically-movable platen 21 is held above the table by an arm 22, mounted on a post 23, movably held by brackets 24. The lower end of the platen-post is engaged by a lever 25, that has a stud engaging the cam-groove in the face of the cam-disk 26, Fig. 2. The corner-blocks 27 are adjustably fastened to the working edges of the upper folder-bars, with their working faces in line with the working edges of the lower folder-bars. Each of these blocks has a small tongue 28, that projects into an undercut groove 29 in the edge of a folder-bar. A screw 30 passes through each block into a nut 31, located in the undercut groove. When the screw is loose, the block may be adjusted along the front edge of the folder-bar. Tightening the screw clamps the block in position, Fig. 4. The working face 32 of each block is concave. A spindle 33 extends vertically through each block, and on the lower end in the plane of the folding-blade bears a finger 34. A spring 35 is wound about a head 36, fastened to the upper end of the spindle in such a manner that it tends to hold the free end of the finger against the edge of the folding-blade.

In operating this mechanism the upper folder-bars are adjusted a distance apart approximately the length of the case-boards from top to bottom, and the lower folder-bars are adjusted a distance apart approximately the distance from the outside edge of one board to the outside edge of the other board of the case. The round-corner blocks are adjusted along the edges of the upper folder-bars, so that the round corners of the boards will just pass down between them, as illustrated in Fig. 6. The table is raised to substantially the level of the top of the upper bars. The cloth, with the glued face uppermost, is placed upon the table, with its edges overlapping the upper folder-bars and overlying the edges of the lower folder-bars, as illustrated in Fig. 7. After the boards and back have been located upon the glued face of the cloth the cams cause the table and the platen to descend and carry the boards and cloth down between the upper folder-bars. This turns up the cloth at the upper and lower edges and at the corners of the boards, as illustrated in Fig. 8. When the parts are in these positions, the cams cause the upper folding-blades to be moved outwardly and fold the cloth that is standing upright over the upper and lower edges of the boards. This movement of the upper folding-blades pushes the fingers attached to the corner-blocks and causes them to be swung around, so as to fold down and smooth out the wrinkles in the cloth at the corners and leave the cloth at the corners in such position that the folding-blades will fold down the cloth along the upper and lower edges smoothly on the inside faces of the boards, as illustrated in Fig. 9. By this operation the cloth at the corners is folded as illustrated in Fig. 10. These blades are then retracted. The mechanisms then cause the table and platen to descend between the lower folder-bars. This turns up the cloth at the side edges of the boards, as illustrated in Fig. 11. Then the lower folding-bars are moved outwardly and fold the cloth which is standing upright down upon the inside face of the side edges of the board, as illustrated in Fig. 12. The result of this is to fold down the cloth in the manner illustrated in Fig. 13. These simple and cheap curved blocks may easily be attached to the folder-bars of any machine of this nature and quickly adjusted to turn the cloth around the corners of books of various sizes. They are durable, and the action of the fingers which smooth the wrinkles out of the cloth at the corners does not appreciably add to the load of the machine.

Means for operating the mechanisms herein described are fully shown and described in the above-referred-to United States patents, so are not set forth in detail herein.

I claim as my invention—

1. In combination with the folder-bars and folding-blades of a cloth-folding machine, blocks having concave folding-surfaces curving from the planes of the working edges of the folding-bars and fingers movably held by the blocks and adapted to be swung outwardly across the plane of the concave surfaces in advance of the folding-blades held by the said bars, substantially as specified.

2. In combination with the folder-bars and folding-blades of a cloth-folding machine, blocks adjustably attached to the folder-bars and having concave folding-surfaces curving from the planes of the working edges of the folder-bars, and fingers adapted to be swung outwardly across the plane of the concave surfaces in advance of the folding-blades held by said bars, substantially as specified.

3. In combination with the folder-bars and folding-blades of a cloth-folding machine, blocks having concave folding-surfaces curving from the planes of the working edges of the folder-bars, fingers movably held by the blocks in the plane of movement of and adapted to be swung outwardly across the plane of the concave surfaces by and in advance of the first folding-blades, substantially as specified.

4. In combination with the folder-bars and folding-blades of a cloth-folding machine, blocks with concave folding-surfaces curving from the planes of the working edges of the folder-bars, fingers below the plane of and adapted to be swung outwardly across the plane of the concave surfaces by and in ad-

vance of the first folding-blades, and springs for returning the fingers to their normal positions, substantially as specified.

5. A corner-folder for a cloth-folding machine, consisting of a block having means for attachment to a machine, a concave corner-turning surface, an oscillating finger pivoted to the block and adapted to be swung outwardly across the plane of the concave surface and a spring for returning the finger inwardly to its normal position, substantially as specified.

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