

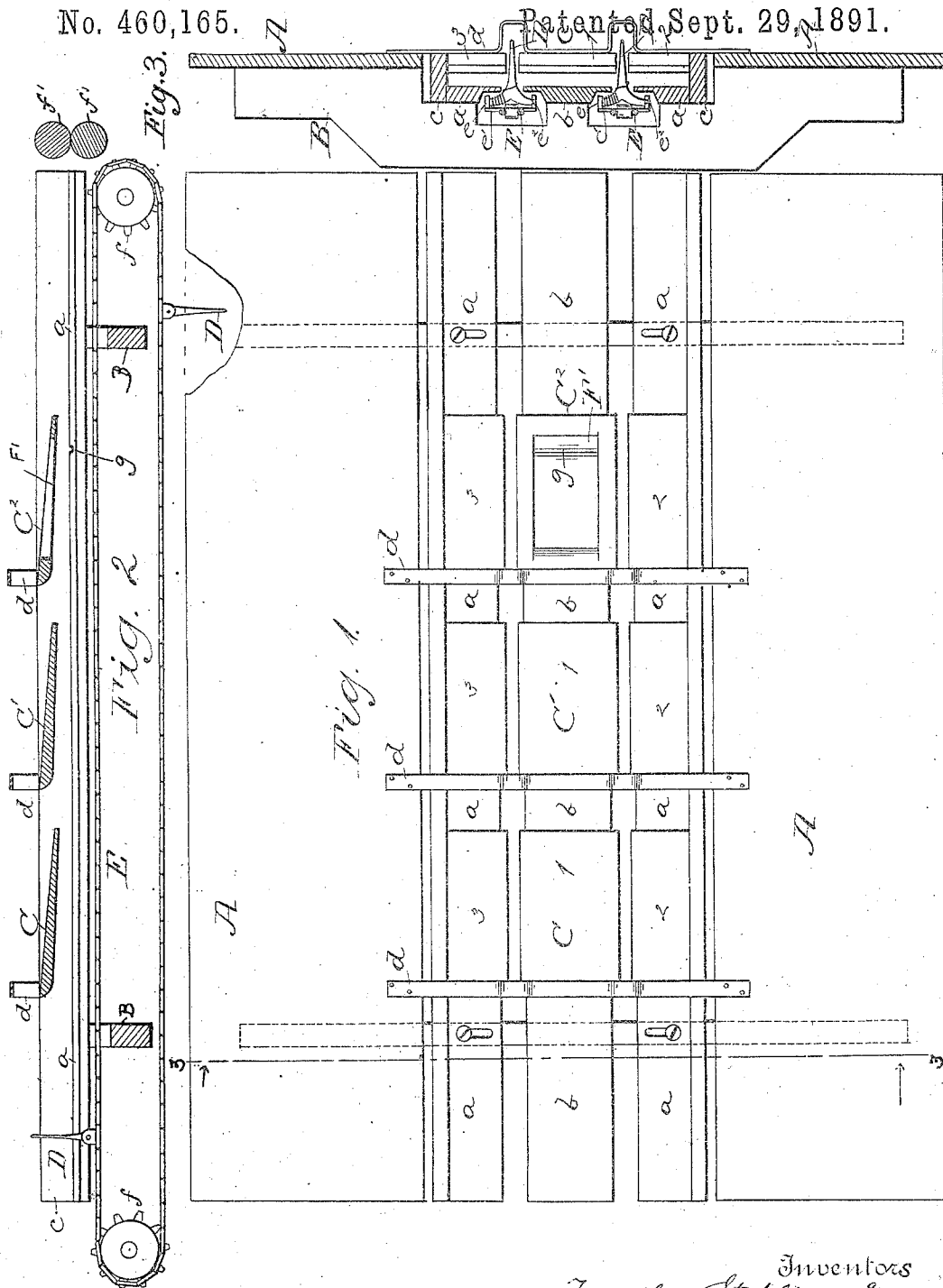
(No Model.)

2 Sheets—Sheet 1.

T. STEBBINS & J. R. McDONALD.
CIRCULAR ASSEMBLING DEVICE FOR FOLDING MACHINES.

No. 460,165.

Patented Sept. 29, 1891.



Witnesses
J. P. Cookage.

Inventors
Timothy Stebbins and
James R. McDonald
By this Attorney
Frank D. Thomson

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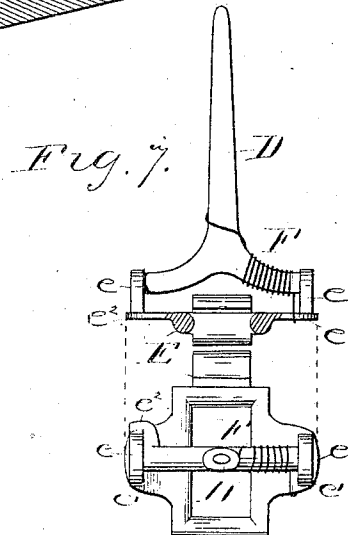
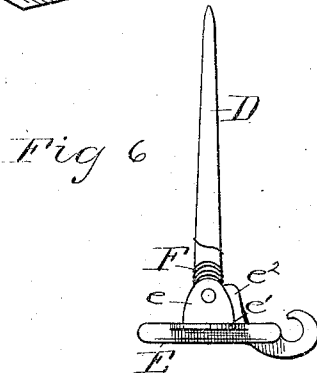
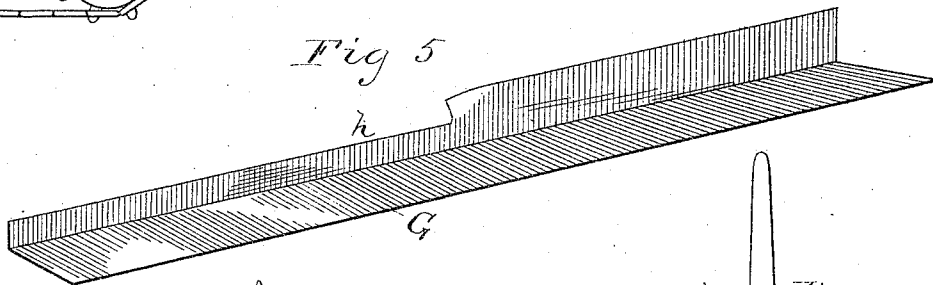
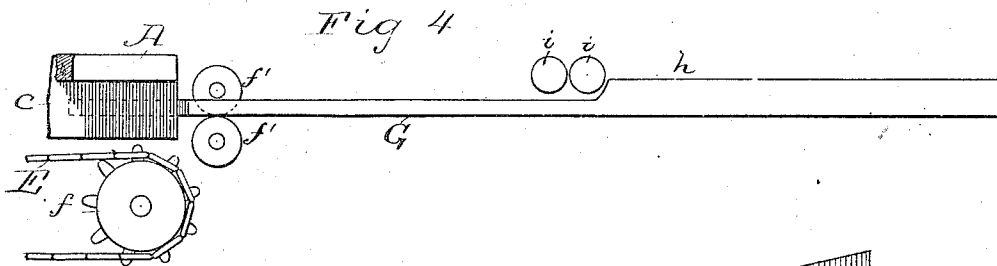
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No. 460,165.

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Timothy Stebbins and
James R. McDonald
Inventors

Witnesses
J. S. McLean
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By their Attorney
Frank D. Thompson.

UNITED STATES PATENT OFFICE.

TIMOTHY STEBBINS AND JAMES R. McDONALD, OF CHICAGO, ILLINOIS,
ASSIGNORS TO THE NATIONAL FOLDING AND ENVELOPING COMPANY,
OF SAME PLACE.

CIRCULAR-ASSEMBLING DEVICE FOR FOLDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 460,165, dated September 29, 1891.

Application filed June 16, 1888. Serial No. 277,374. (No model.)

To all whom it may concern:

Be it known that we, TIMOTHY STEBBINS and JAMES R. McDONALD, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Circular-Assembling Devices for Folding-Machines, of which the following is a specification.

Heretofore the assemblage and nesting of printed matter in circular form preparatory to folding the same and inserting it in envelopes has been entirely done by manual labor. This method is both slow and expensive and subject to all the difficulties, disadvantages, and tendencies to error which work of that or analogous character is liable to when performed by human hand.

The object of our invention is to provide mechanism for assembling or nesting double-letter, letter, and note size circulars, cards, return-envelopes, &c., preparatory to delivering the same to a folding-machine in such manner that such assembled matter can be conveniently, neatly, and quickly folded ready for envelopes, all as hereinafter fully explained, and as illustrated in the drawings, in which—

Figure 1 is a plan view of a machine embodying our invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a transverse vertical section taken on the correspondingly-numbered line in the first figure. Fig. 4 represents in side elevation the end of the table, together with elongated delivery-ways by which material having received a preparatory fold may be discharged upon the assembling mechanism. Fig. 5 is a perspective view of one of said ways, and Figs. 6 and 7 are details of the assembling-chains.

A represents a table or platform consisting of two parallel wings separated a suitable distance and supported and maintained in their relative positions by underlaid cross-rails B, which have their upper edges between the wings cut away to a lower horizontal plane. Secured to these sunken edges of the cross-rails is the floor of the way upon which the matter to be folded or in part al-

ready folded is delivered and assembled and along which such matter is carried to be fed to a folding-machine to receive the final fold. This floor is composed of two longitudinal transversely-adjustable side strips *a* and a central strip *b*, parallel with each other. Secured to and rising from the outer edges of the side strips, adjacent to the contiguous wings of the table, are guards *c*, which form the walls of the way and by the adjustment of said strips may be brought nearer to or separated farther from each other, according to the size of the material being assembled, so as to guide said material and prevent it from twisting or becoming awry as it is carried along the way, or getting out of register, so as to interfere with the proper nesting or assembling of subsequent material therewith or with the action of the folding-machine. The strips forming the floor of the way are so spaced as to leave between them two longitudinal slots, one between each edge of the central and the antiposed edge of the adjacent side strip. The material is carried forward by means of feed-fingers which rise vertically through the longitudinal slots left between the central and side strips of the floor of the way and travel therealong abreast of each other, so as to rake or push the material delivered to said way toward and to the folding-machine; but such fingers and their mode of operation will be described and explained more fully hereinafter.

C C' C² represent feed-shelves, consisting of sections, according to the number of raking-teeth abreast, numbered 1, 2, and 3, respectively, section 1 being secured to the transverse brace *d*, the ends of which rest upon and are fastened to the wings of the table in such manner as to bridge over the way. Sections 2 and 3 of said shelves are arranged longitudinally, one on each side of the central section, and in the present instance may be considered as suitably fastened to the guards of the side-strips of the floor of the way. The spaces between the sections correspond with the spaces between the strips of the flooring, so that the teeth above mentioned may sweep through such spaces as they pass along the

way, and the incline of the shelves is in the direction of movement of such teeth. Three of these shelves are shown in the drawings tipped longitudinally toward the way and located in such relative position that the lower edge of one shelf comes below the plane of the under surface of the higher edge of the next following shelf, or so that two parallel planes may touch the one the lower edges and the other the higher edges of all the shelves, although such uniformity of height is not strictly essential. Thus as the fingers move through the slots between the floor-strips they rake the paper material, usually circulars of letter or note size, or cards or return-envelopes, which are fed from the wings of the table upon said delivery inclines or shelves by attendants as fast as need be to keep the machine supplied, off of the shelves one at a time, and so that the material raked from the second shelf falls upon or is nested in the material just before raked from the first, and the material from the third shelf is received on top of that already assembled, and so on, according to the number of shelves, when finally all the material thus assembled will be delivered in such condition to the folding-machine.

The feed-fingers D, referred to as projecting upward through the slots between the flooring-slats, reach to a point just above the horizontal plane of the upper surface of the table, which will advisably be practically flush with the most elevated part of the feed shelves and above the top of the body thereof, so that the attendants can readily slip the printed matter or circulars piece by piece upon the shelves from the piles lying before them on the table. To accommodate said fingers, so that they may certainly reach and effectually sweep the printed matter from the shelves, the braces which bridge the ways and support the central sections of the shelves are arched or bowed above the slots or intersectional spaces through which said fingers move, as shown in the third figure of the drawings, thus allowing the fingers from the outset to project slightly above the highest plane of the shelves. Said feed-fingers are bifurcated at their lower ends, and the extremities of their bifurcations are journaled in the lugs *e*, arising from the horizontal wings *e'*, projecting transversely from the side bars of certain of the links of the chain belts E, as shown. In order to keep these feed-fingers in a vertical position, we provide the extremity of one of the bifurcations thereof with a stop-finger *e''*, which strikes against and is stopped by the periphery of the lug *e* and prevents the finger from oscillating forward and beyond the proper limit, and arrange a coiled spring F upon and surrounding the other bifurcation, one end of which spring is secured to one of the wings *e*, of the chain-link carrying the finger and the other to said finger in such manner as to urge it forward against the stop, but permit it to yield to the rear when meet-

ing an obstruction, returning it immediately to its normal vertical position upon the resistance being removed. The belts E, which carry these feed-fingers, are two in number and run the entire length of the platform immediately under and parallel with the slots in the floor of the way. These belts run over sprocket-wheels *f*, mounted upon shafts at each end of the way, and are actuated by one set of these sprocket-wheels, which is driven by suitable power, the other set being idle. At the delivery end of the belts the material carried by them along the ways may be delivered to a pair of tape-rollers *f'* and carried by tapes therefrom to the folding-machine, and these rollers will be necessarily close to the sprocket-wheels around which the belt passes, and will therefore be struck by the feed-teeth, which, however, will yield, as already explained, until they pass this obstruction, and then will swing back to their normal position, ready to again sweep the shelves as they return to the upper ply of the chains. If, however, there are no obstructions in the way of these feed-teeth, it is evident that they need not be so attached to their belts as to fold back or knuckle.

The operation of the machine so far as described is substantially as follows: The printed matter is placed in stacks or piles upon the table in such position that it can be conveniently grasped by the operator, by whom it is placed, one or more circulars at a time, upon the inclined shelves. The fingers travel through the slots in the floor of the way and rake the circulars, one at a time, from the inclines in the order in which said inclines are approached, so that said circulars come successively one on top of the other. The fingers, continuing on their movements toward the folding-machine, sweep the assembled folded matter before them directly between the tape-rollers and tape. Sometimes it is desired to inclose one or more business or advertising cards in the folded circular which would be too small when placed in the proper position to be caught and pushed along by the delivery-fingers to the folding-machine. We provide for such an emergency by cutting a rectangular piece from the central section of one or all of the inclines, making an opening F', the transverse edge of which nearest the brace *d* is beveled. We drop the card or cards so that one end rests upon the bevel edge and so that the other rests in a transverse groove *g* in the central strip of the way. Thus when the advanced edge of the assembled matter which is being pushed along by the delivery-fingers strikes the end of the card resting in the groove *g* it draws the card onto the center of matter to be folded, so that when the folding operation takes place said card is inclosed with the same. It is sometimes advisable, in order to prevent the matter to be folded from deflecting to one side while being carried by the tapes to and under the folding-blades or

other devices of the machine, to provide the extension ways or chutes G. These chutes are preferably made of sheet metal and have their outer edges *h* flanged upward to serve
 5 as guides and guards and are secured to and form longitudinal extensions of the side strips of the floor of the way. The journals of the tape-rollers are usually less in diameter than the body, thus forming a shoulder with said
 10 body. Instead, therefore, of cutting away the vertical flanges *h* of the ways or chutes where they pass said rollers, we make said vertical flanges of such height that they shall rise past the shoulders thus formed of the upper-
 15 most tape-roller until they touch or about touch the journals, thus cutting off the folding matter as it passes between the rollers from lateral displacement.

If the assembling and feeding devices just
 20 explained supply the matter to a second course of tapes and there is an independent course of tapes at a higher level for assembling and folding a double-sheet-sized circular and nesting it with the other matter, then
 25 the flanged edges of the chutes, after they pass the transverse plane determined by the folding-rollers *i* of such upper course of tapes, rise sufficiently higher to serve as a guide for the entire accumulated matter delivered by
 30 both courses of tapes, substantially as shown in Figs. 4 and 5 of the drawings.

It is possible, although not desirable, to dispense entirely with the inclined shelves. In this event the circulars would have to be
 35 deposited upon the floor of the way in front of the delivery-fingers, one on top of the other, by hand. This would require considerable expert ability; but it could be done, since the feed-table extends level and unob-
 40 structed practically the whole length of the way and permits two or more operators to feed from successive stacks. Towards this the sinking of the guideway materially contrib-
 45 utes, as the circulars or other material to be folded can be stacked upon the wings of the feed-table and deftly swept off one by one in advance of the feed-fingers.

Instead of the way or channel into which the matter is placed and assembled being lo-
 50 cated below the plane of the table, it may be raised to the same plane as or above said table. Either construction is a mere question of preference; but the one described is most convenient. Moreover, instead of two wings
 55 to the table, only one need be used, if it is so desired.

We do not limit the application of our improved folding devices to any special form of folding-machine; nor do we limit ourselves to
 60 any invariable number of delivery-shelves, nor to the use of a chain belt for operating the delivery or assembling fingers; but

What we claim as our invention, and desire to secure by Letters Patent, is—

65 1. The combination, substantially as here-
 inbefore set forth, with the guideway provided with lateral guards, of delivery-fingers

moving longitudinally along said guideway and an unobstructed feed-table extending
 along said way, whereby material may be fed
 70 to it from successive stacks by the attendants.

2. The combination, substantially as here-
 inbefore set forth, with the platform or feed-
 table and a guide channel or way sunk be-
 75 neath the surface of the table, of delivery-
 fingers moving longitudinally in and along
 said sunken guideway.

3. The combination, substantially as here-
 inbefore set forth, with the platform or feed-
 table and a guide channel or way sunk be-
 80 neath the surface of the table, of adjustable
 side guards to said channel or way and de-
 livery-fingers moving longitudinally in and
 along said sunken way and between the lat-
 eral guards thereof. 85

4. The combination, substantially as here-
 inbefore set forth, with the feed-table and
 guideway, of a shelf placed over the guide-
 way and delivery-fingers traversing said way
 and arranged to sweep said shelf of its load,
 90 whereby the latter is deposited in the guide-
 way and carried therealong by said fingers.

5. The combination, substantially as here-
 inbefore set forth, with the feed-table and
 guideway, of a series of shelves placed over
 95 the guideway, one in advance of another, and
 delivery-fingers traversing said guideway and
 arranged to sweep each shelf in succession
 of its load, whereby the material received
 from the shelves is assembled and piled. 100

6. The combination, substantially as here-
 inbefore set forth, with a feed-table and guide-
 way, of a series of shelves placed over the
 guideway, one in advance of another, and hav-
 105 ing longitudinal slots therethrough parallel
 with the length of the guideway, and delivery-
 fingers traversing said guideway and project-
 ing up through said slots above the surface
 of said shelves, whereby they sweep the shelves
 successively and collect and assemble the ma-
 110 terial laid thereon.

7. The combination, substantially as here-
 inbefore set forth, with a feed-table and a
 guideway having longitudinal slots through
 115 its bottom, of a shelf or shelves placed over
 the guideway and having slots therethrough
 corresponding with the slots in the bottom of
 said guideway, and delivery-fingers moving
 along and projecting up through the slots in
 the guideway and in the shelf or shelves to
 120 sweep the latter of the material laid thereon
 and carry it along the guideway.

8. The combination, substantially as here-
 inbefore set forth, with a feed-table and a
 guide way or channel provided with lateral
 125 guards and having a transverse notch at a
 point in its length, of a shelf bridging the
 channel above said notch and having an open-
 ing through its body to admit a card, and
 carrying and delivery fingers moving along
 130 said channel or way.

9. The combination, substantially as here-
 inbefore set forth, with a feed-table and a
 guideway having a transverse notch in its

bottom, of a series of shelves placed over the guideway, one in advance of another, and one of which is placed above said notch and provided with an opening directly thereover to admit a card, and delivery-fingers traversing said guideway and arranged to sweep each shelf in succession of its load and carry it along, whereby the assembled material carried before the fingers will strike and carry along the card introduced through said opening.

10. The combination, substantially as hereinbefore set forth, with the feed-table and the sunken guideway, of the sectional shelves arranged above said guideway, the braces bridging the guideway and arched or bowed above the spaces between the sections of said shelves, and the delivery-fingers traversing said guideway and projecting up into the arches of said braces and sweeping through the slots between said sections.

11. The combination, substantially as hereinbefore set forth, with the feed-table, of the guideway having parallel movable flooring-sections on each side thereof provided with lateral guards, means whereby said sections may be adjusted toward and from each other, and delivery-fingers traversing said guideway longitudinally thereof between said sections.

12. The combination, substantially as hereinbefore set forth, with the feed-table, of the guideway having a central longitudinal flooring-section and parallel movable flooring-sections on each side thereof provided with lateral guards, means whereby said side sections may be adjusted toward and from each other, and delivery-fingers traversing said guideway longitudinally thereof.

13. The combination, substantially as hereinbefore set forth, with the table-wings, of the transverse rails uniting them and cut away to a lower plane between them, the central flooring-strip, the two side flooring-strips with their lateral guards, and the delivery-fingers projecting up through and moving longitudinally in the slots or openings left between said central and side strips.

14. The combination, substantially as hereinbefore set forth, with the table-wings, of the transverse rails uniting them and cut away to a lower plane between them, the longitudinal central and side flooring-strips, the delivery-shelves placed transversely above said strips, and the delivery-fingers moving longitudinally in the slots or openings between said central and side strips and adapted to oscillate yieldingly to the rear.

15. The combination, substantially as hereinbefore set forth, with the table-wings, of the transverse rails uniting said wings and cut away to a lower plane between them, the longitudinal central and side flooring-strips secured to said rails, the inclined shelves ar-

65 ranged transversely above said flooring-strips, the delivery-fingers moving along the slots or openings between said strips, the endless belts carrying said fingers, and the pivotal stop and spring connection between said fingers and belts.

16. The combination, substantially as hereinbefore set forth, with the feed-table and the guideway with its lateral guards, of the shelves, the delivery-fingers moving along said guideway and sweeping said shelves, and the tape-rollers to which said feed-fingers deliver the assembled material.

17. The combination, substantially as hereinbefore set forth, with the feed-table and guideway provided with lateral guards, of shelves placed above said guideway, delivery-fingers moving along said guideway and sweeping said shelves of the material placed thereon, and the extension ways or chutes.

18. The combination, substantially as hereinbefore set forth, with the feed-table and guideway provided with lateral guards, of the delivery-fingers moving along said guideway, the extension-way having lateral guards, and the transverse folding-rollers placed above said extension-way.

19. The combination, substantially as hereinbefore set forth, with the feed-table and guideway provided with lateral guards, of the delivery-fingers moving along said guideway, a pair of transverse folding-rollers, and an extension-way leading beneath the folding-rollers and provided with lateral guards increased in height beyond said rollers.

20. The combination, substantially as hereinbefore set forth, with the feed-table and guideway provided with lateral guards, of shelves placed above said guideway, delivery-fingers moving along said guideway and sweeping said shelves of the material placed thereon, the tape-rollers to which said fingers deliver the assembled material, and the extension ways or chutes.

21. The combination, substantially as hereinbefore set forth, of the table, the guideway, the assembling and delivering fingers, the tape-rollers to which they deliver, and the extension ways or chutes having lateral guard-flanges setting up past the ends of the uppermost tape-roller and toward the journals thereof.

22. The combination, substantially as hereinbefore set forth, of the table, the guideway, the delivery-fingers moving along said guideway, the tape-rollers to which they deliver, the extension-way having lateral guard-flanges, and the folding-rollers located above said extension-way and transversely thereof.

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