L. C. PALMER.

STACKING MECHANISM.

APPLICATION FILED DEC. 27, 1910.

1,067,839.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

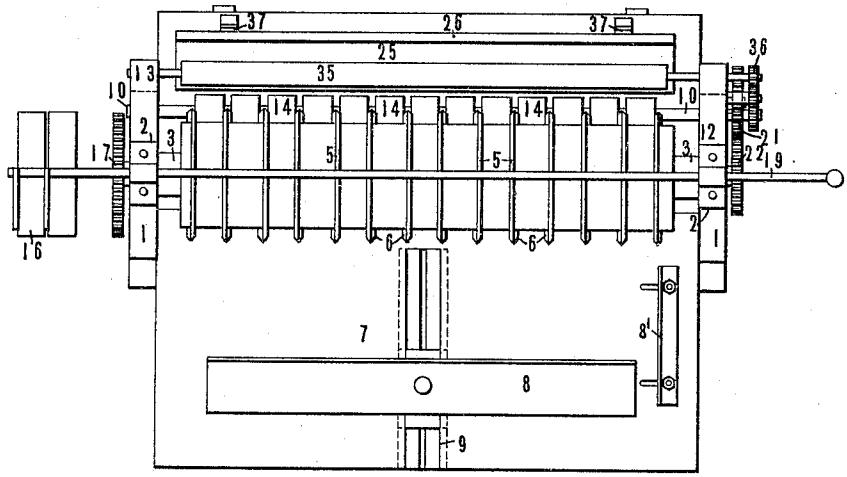
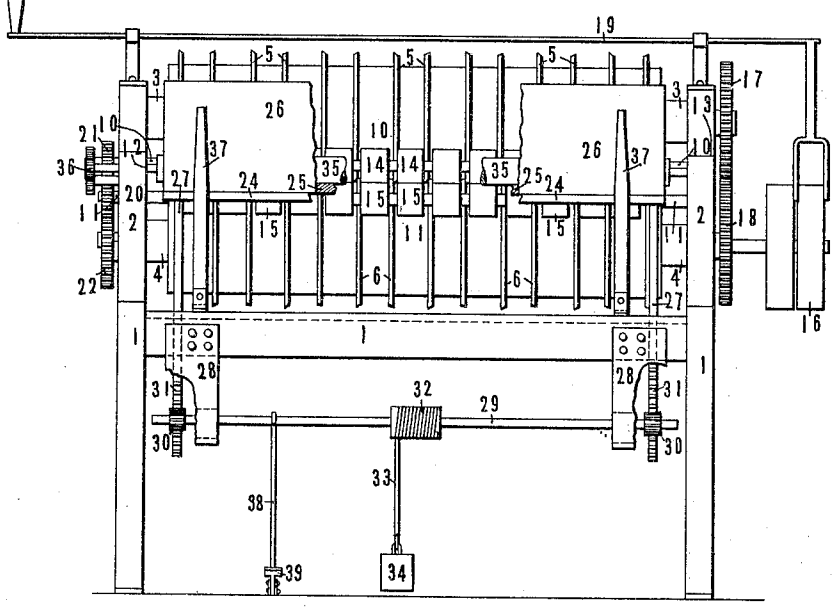


Fig. 1.

Fig. 2.



WITNESSES

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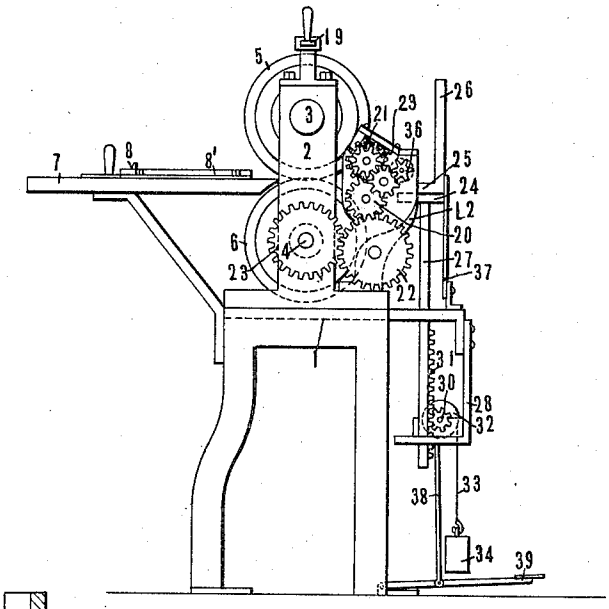


Fig. 3.

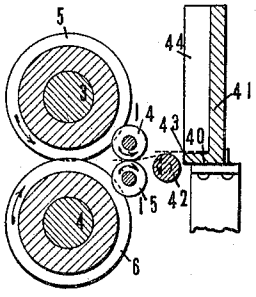


Fig. 5.

Fig. 4.

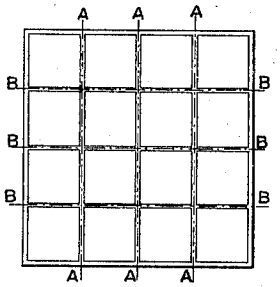
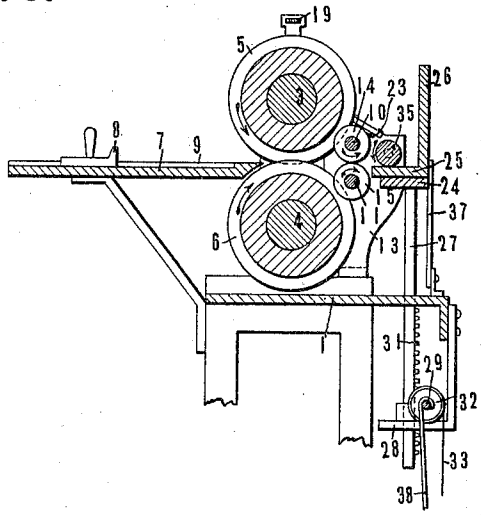


Fig. 6.



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STACKING MECHANISM.

1,067,839. Specification of Letters Patent. **Patented July 22, 1913.**

Application filed December 27, 1910. Serial No. 599,381.

To all whom it may concern:

Be it known that I, LYNDON C. PALMER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Stacking Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mechanism for assembling and supporting articles or blanks of material such as paper, cardboard, strawboard, etc., and more especially to mechanism for dividing sheets of the material of the character referred to into strips or blanks and stacking the blanks in certain definite and predetermined relations.

One object of the invention is the production of an efficient mechanism to divide sheets of material of the character above referred to and assemble the divisions in stacks or piles.

Another object is the provision of practical means for receiving and stacking blanks in a certain order or arrangement.

Another object is to produce a simple and comparatively inexpensive machine whereby sheets of material may be quickly and accurately divided into sections and the sections stacked side by side, the stacks preserving a predetermined relative disposition of the sections.

Other objects will be in part obvious and in part appear hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein similar reference characters refer to similar parts throughout the several views, Figure 1 is a plan view of the mechanism; Fig. 2 is a front elevation thereof partly broken away; Fig. 3 is a side view of the mechanism; Fig. 4 is a vertical section thereof; Fig. 5 shows in section a modified arrangement; and Fig. 6 shows a sheet of material.

In the manufacture of paper articles, such as boxes, and especially in the production of labeled boxes, or other articles, economy of time and material is effected by systematic methods of manipulating the materials which are employed. Given the materials out of which to make a number of boxes, many different modes of handling the material may be made use of to accomplish the object in view. The present invention is more especially designed to facilitate the rapid manufacture of a large number of boxes by effecting certain arrangements of the parts operated upon in order that other or subsequent operations may be more quickly and easily accomplished. An example of the utility of the invention is offered in the manufacture of a cigarette box, having a head and a flange, or sides, secured thereto. These boxes are usually labeled, and the heads are cut from a large sheet having the labels symmetrically distributed over its surface so that two cuts at right angles to each other between the several labels will produce a number of labeled box heads. Fig. 6 represents a large sheet labeled as described and the sheets are cut on the lines A, A, into long strips which are in turn cut at right angles to the lines A, A, into small portions or heads, on the lines B, B. For purposes of subsequent manipulation it is desirable to preserve a certain relative position of the labeled heads or blanks and by means of this invention such object is accomplished, although it will be obvious that the invention is not limited to this purpose and is capable of wide application and without regard to the relative arrangement just referred to.

Referring now more in detail to the mechanism illustrated, the numeral 1 indicates a supporting frame having at each end a standard 2. Mounted in the standards over the frame is a dividing, cutting or slitting mechanism adapted to simultaneously cut a sheet or strip of material of the character above referred to into a series of fractional elements, strips or blanks and deliver said parts from the cutters. Preferably the dividing mechanism comprises two horizontal series of parallel circular cutters rotating in vertical planes. Parallel horizontal shafts are indicated at 3 and 4 journaled in the standards 2, each shaft having secured thereto circular cutters of any suitable construction, in the present instance comprising spaced circular knives 5 and 6 concentric to their respective shafts. The knives are so disposed on their shafts as to coöperate two

and two in the shearing operation and the horizontal space between the knives of each series determines one dimension of the resultant severed blanks. The cutters of the respective series are rotated in opposite directions, as indicated by the arrows in Fig. 4. In front of the coöperative portions of the cutters is a horizontal platform 7 provided in this instance with a hand operated strip feeding device or pusher 8 adapted to reciprocate toward and from the cutters, and guided in a slot 9 in said platform. An adjustable gage 8′ is provided to accurately locate the strips with respect to the cutters. It is obvious, however, that the pusher 8 may be connected by a connecting rod or link to the driving mechanism of the cutters and thus operate automatically.

Supported in rear of the cutters are rotary shafts 10 and 11, journaled in brackets 12 and 13 projecting upwardly from the supporting frame. These shafts are parallel to the cutter shafts and coextensive with the series of cutters and each shaft is provided with a series of guiding rollers 14 and 15 secured thereto to rotate therewith. The rollers 14 and 15 are spaced apart on their respective shafts, a roller of each shaft being located between each pair of coöperating knives. The rollers of the respective shafts 10 and 11 are also located opposite each other and close together so that a blank inserted between them will be grasped and moved by said rollers. Between the pairs of coöperating cutters the peripheries of the rollers 14 and 15 lie close to the circular base portions of the cutters, so as to act as strippers for the series of knives, and also afford less distance for the blanks to move before being guided and supported by said rollers. One of the shafts of the cutters is provided with a belt pulley 16, and the said cutters are driven in unison in opposite directions by intermeshing gears 17 and 18 secured to their respective shafts. A belt shifter 19 is slidably mounted on the standards and provided with a suitable operating handle. The cutters are rotated in a direction to deliver the cut strips or blanks between the guiding rollers 14 and 15, and these latter are rotated in opposite directions, but in the same relative directions as the cutters to feed the blanks therebetween and to the stacking or assembling mechanism, as will hereinafter appear. Movement of the rollers 14 and 15 in the described direction may be accomplished in any suitable manner, in the present embodiment each shaft being provided with a gear wheel 20 and 21, said gear wheels intermeshing and driven from the shaft 4 by a train of gears 22 and 23, the gear 22 being supported in the bracket at one end of the machine. Preferably the upper rollers 14 are mounted so as to be permitted to have a movement toward and from the lower rollers 15 to accommodate material of different thicknesses, this being accomplished by mounting the shaft of rollers 14 in a bearing box adapted to slide in inclined slots 23 in the brackets 12 and 13. When the cutters operate on a sheet of material a series of blanks or strips is delivered therefrom and may be received on any suitable support, and it will be obvious that subsequently cut sheets will provide blanks which may be delivered to said support while the previously cut blanks remain thereon. In order to obtain regularity of arrangement of several successive series of blanks and to facilitate subsequent manipulation, the blanks or strips, after leaving the cutters, are assembled or stacked in orderly piles, in which a predetermined position of each blank is attained.

In rear of the cutters is located a supporting device or table 24 to receive the blanks, and on which they are held in a plurality of piles or stacks. Preferably the table comprises a removable top 25, having an upstanding flange or wall 26 to serve as a stop to limit the movement of blanks delivered to the table and to gage their position. In the preferred form of the invention the table is yieldingly supported with its top in a horizontal plane slightly below the horizontal plane through the meeting edges of the cutters, so that the blanks will be readily received thereby, one on top of another, as the table descends, as will hereinafter appear. The yielding support for the table comprises supporting rods 27 depending from the table and guided in openings in the supporting frame and in brackets 28 horizontally positioned beneath the frame, near each end thereof. A horizontal drum shaft 29 is journaled at each end in bearings carried by said brackets, and is provided with pinions 30 which engage racks 31 on the rods 27. A drum 32 is secured to the shaft 29 and a strap 33 is fastened at one end to the drum, its other end having a weight 34 removably secured thereto. By means of the construction described it will be apparent that the table will be pressed by the weight upwardly, but will yield to pressure applied in an opposite or downward direction. In order to limit the upper position of the table and to obtain other results, as will hereinafter appear, a horizontal, preferably cylindrical and metallic, friction roller 35 is journaled between the brackets 12 and 13 in the path of the table 24 and in rear of the rollers 14 and 15. This roller is designed to move or draw as well as guide or direct the blanks or strips onto the table when said blanks are presented thereto, and rotary motion is given to said roller by means of a train of gear from the shaft 4 and driving a pinion 36 secured to the friction roller. The friction roller is coexten-

sive with the series of cutters and coöperates with the top surface of the table to grip blanks and draw them along the table toward the stop 26, where they are held from further horizontal movement. Preferably the friction roller 35 contacts with the upper surface of the table and is so disposed that the point of contact is slightly below the horizontal line of presentation of the blanks to the table, so that the ends of the blanks will strike the surface of the roller 35 and be deflected onto the table.

The operation of the apparatus will now be apparent. A sheet of material similar, for instance, to that shown in Fig. 6, having labels symmetrically distributed over its surface, as before explained, is fed to a suitable cutter or slitter and long strips are cut therefrom, each strip containing several labels. These strips are then successively fed widthwise to the cutting mechanism shown and each strip is divided or cut into fractional elements or blanks, each having a label. If these blanks were delivered freely directly from the cutters to an ordinary receiving table, but little if any prearranged relationship therebetween or position of the blanks on the table could be accomplished if the blanks were comparatively short. The guiding and stripping rollers 14 and 15, however, are close enough to the cutters to receive the blanks as they issue from the cutters and deliver them to the stacking mechanism. The forward ends of the first series of blanks will be deflected toward the table by the surface of the friction roller 35 and said roller coöperating with the surface of the table will draw the blanks onto the table, preserving the relative lateral spacing of the blanks and their movement on the table being limited by the stop 26. The introduction of the blanks between the friction roller and the table will depress the table the thickness of a blank and succeeding blanks will follow a course similar to that outlined for the first series, except that they will be delivered and stacked on the preceding delivered blanks. It will furthermore be observed that in passing from the cutters to the table the blanks are not turned or rotated in the plane of their surfaces, so that each blank of each stack has the same relative position. Thus when the blanks are labeled they are stacked with their labels identically arranged. It is obvious, however, that the invention is not limited to stacking labeled blanks, this being merely one of its many useful applications. The table 24, as before stated, comprises a removable top 25, so that when a sufficient number of blanks has been stacked they may be removed by simply removing the top. In the preferred embodiment the top simply rests upon the upper surface of the table, beneath the friction roller 35, being held from rearward movement by abutments 37 pivoted to the frame and adapted to be moved into position opposite the table top to restrain rearward movement thereof.

A brake comprising a hooked rod 38 pivotally connected to a treadle 39, is adapted to engage the surface of the drum shaft 29 to restrain movement of said shaft when desired.

A modified form of stacking device which may be employed in connection with the cutting mechanism, hereinbefore described, comprises a table 40 having a stop device or wall 41 similar to that of the table top 25, this table being stationarily supported with respect to the cutters and the guiding rollers 14 and 15. A friction roller 42 has its upper surface slightly above the horizontal median line between the rollers 14 and 15 and the blanks delivered from the rollers are deflected upwardly onto the table. In this instance the wall 41 is positioned to stop the blanks with their rear ends projecting beyond the front edge 43 of the table over the friction roller so that the friction roller deflects the subsequent blanks after the first series beneath the projecting blanks and so onto the table, the preceding blanks being displaced upwardly by the succeeding blanks. In this modified form the table is preferably provided with end pieces 44 to retain the stacks in place thereon, and as the roller 42 is beneath the blanks its direction of rotation is properly modified to drive the blanks toward the table.

It will be obvious that the stacking mechanism may be employed in connection with any suitable device adapted to feed and deliver blanks or similar articles thereto, the cutting mechanism described being, however, the preferred device for feeding the blanks to the stacker. It is also evident that the blanks may be delivered directly from the cutting mechanism to the stacking mechanism, especially when the articles emerging from the cutters are of such character as to present themselves directly to the stacker without the intervention of the guide rollers 14 and 15.

By the above described construction mechanism is provided which efficiently accomplishes, among others, the objects hereinbefore set forth.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of

the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the character described, in combination, a friction roller and a horizontal table between which a blank is adapted to move and be gripped, a stop to limit the movement of the blank, means to rotate the roller in a direction to move the blank toward the stop, and means to permit the table to move away from the roller.

2. In an apparatus of the character described, in combination, a friction roller and a table between which a blank is adapted to move, said table comprising a movable top having a stop in the path of the blank, means to rotate the roller in a direction to move the blank toward the stop, and means to permit the table to move away from the roller.

3. In an apparatus of the character described, in combination, a supporting frame, a horizontal friction roller rotatably supported thereby, a table guided in the frame and adapted to move toward and from the surface of the friction roller, a shaft, gearing between the table and shaft, and means to operate the gearing to yieldingly press the table against the roller.

4. In an apparatus of the character described, in combination, a supporting frame, a horizontal friction roller rotatably supported thereby, a table guided in the frame and adapted to move toward and from the surface of the friction roller, a shaft, gearing between the table and shaft, and a weight connected to the shaft to elevate the table.

5. In an apparatus of the character described, in combination, a supporting frame, a horizontal friction roller rotatably supported thereby, a table guided in the frame and adapted to move toward and from the surface of the roller, a rack on the table, a shaft supported on the frame and having a pinion meshing with the rack, and means to operate the shaft to yieldingly elevate the table.

6. In an apparatus of the character described, in combination, a table comprising a removable horizontal top having a stop wall, means permitting the table to yield downwardly, and pivoted arms adapted to be moved into and out of position opposite the wall of the top.

7. In an apparatus of the character described, in combination, means adapted to divide successive sheets of material into fractional elements, a support adapted to receive said elements, and means adapted to stack said elements one upon another on said support and press the stacks thereagainst.

8. In an apparatus of the character described, in combination, means adapted to divide successive sheets of material into fractional elements, a support adapted to receive said elements, means adapted to move the elements from the dividing means to the support, a device adapted to limit the movement of the elements relative to the support, and means adapted to stack said elements on the support and continuously press the stack thereagainst.

9. In an apparatus of the character described, in combination, means adapted to divide successive sheets of material into fractional elements, a support adapted to receive said elements, mechanism adapted to assemble the successive elements in stacks side by side on said support comprising a friction roller, and means adapted to deliver succeeding elements into contact with the roller and the preceding element.

10. In an apparatus of the character described, in combination, means adapted to divide successive sheets of material into fractional elements, a support adapted to receive said elements, means adapted to move the elements from the dividing means to the support comprising a roller intersecting the path of movement, and means adapted to press the support toward the roller to grip the elements.

11. In an apparatus of the character described, in combination, mechanism comprising coöperating rotary cutters adapted to divide a sheet of material into fractional elements, a table adapted to receive and support said elements, a deflecting roller, and means whereby said roller and table are pressed toward each other.

12. In an apparatus of the character described, in combination, mechanism comprising coöperating rotary cutters adapted to divide a sheet of material into fractional elements, a table adapted to receive and support said elements, a deflecting roller, means whereby said roller and table are pressed toward each other, and coöperating rollers adapted to support and deliver the elements from the cutting mechanism to between the roller and the table.

13. In an apparatus of the character described, in combination, parallel coöperating rotary cutters, coöperating supporting and delivery rollers parallel thereto, and a stacking mechanism comprising a friction roller, a table, and means adapted to yieldingly press the table toward said roller.

14. In an apparatus of the character described, in combination, a frame, upright standards supported thereby, coöperating rotary circular cutters supported by said standards, coöperating supporting and de-

livery rollers parallel to said cutters, a friction roller parallel thereto, means adapted to rotate the cutters, the supporting and delivery rollers and the friction roller so as to cut material and feed the same from one to the other, a horizontal table, and means adapted to yieldingly press the table toward the friction roller.

15. In an apparatus of the character described, in combination, a frame, upright standards supported thereby, coöperating rotary circular cutters supported by said standards, coöperating supporting and delivery rollers parallel to said cutters, a friction roller parallel thereto, means adapted to rotate the cutters, the supporting and delivery rollers and the friction roller so as to cut material and feed the same from one to the other, a horizontal table, a removable top therefor comprising a stop wall, rods depending from the table and provided with rack teeth, guideways for said rods, a shaft, a drum on said shaft, a weight flexibly connected to said drum, pinions on the shaft meshing with said racks, and movable abutments on the frame adapted to contact the stop wall.

16. In an apparatus of the character described, in combination, means adapted to simultaneously divide a sheet of material into fractional elements, a support adapted to receive said elements, and a roller adapted to simultaneously draw said elements onto the support and hold same thereon.

17. In an apparatus of the character described, in combination, means adapted to simultaneously divide a sheet of material into fractional elements, a support adapted to receive said elements, and a single friction roller adapted to simultaneously draw said elements onto the support and hold same thereon.

18. In an apparatus of the character described, in combination, a series of coöperating rotary circular cutters adapted to divide successive sheets of material into fractional elements simultaneously, a table adapted to receive said elements, a positively driven friction roller adapted to contact each element of the series and draw the same onto the table, and means to permit the table to yield upon the reception of subsequent fractional elements.

19. In an apparatus of the character described, in combination, a table, a supporting frame, a horizontal friction roller rotatably supported thereby, means to rotate the roller in a direction to feed blanks to the table, said table guided in the frame and adapted to move toward and from the surface of the friction roller, a shaft, gearing between the table and the shaft, and means adapted to operate the gearing to yieldingly press the table toward the roller.

20. An apparatus of the character described, comprising in combination, a plurality of parallel series of coöperating rotary cutters adapted to divide successive sheets of material into fractional elements, a horizontal support adapted to receive said elements, and means adapted to stack succeeding elements one above another on said support comprising a single horizontal friction roller adapted to guide each element into position opposite the support and between itself and the preceding element.

21. An apparatus of the character described, comprising in combination, a plurality of parallel series of coöperating rotary cutters adapted to divide successive sheets of material simultaneously into fractional elements, a horizontal support adapted to receive said elements in stacks side by side, means adapted to stack succeeding elements one above another on said support in stacks side by side comprising a rotatable friction device adapted to guide each element into position opposite the support and between itself and the preceding element, and means adapted to permit the support to yield relatively to the friction device.

22. In an apparatus of the character described, in combination, means adapted to divide successive sheets of material into frictional elements, a support adapted to receive said elements, means adapted to move the elements from the dividing means to the support comprising a deflector intersecting the path of movement, and means adapted to cause the deflector and support to automatically yieldingly press toward each other to grip the elements.

In testimony whereof I affix my signature, in the presence of two witnesses.

LYNDON C. PALMER.

Witnesses:

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MARY R. CASS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."