Feb. 26, 1929. 1,703,594

R. C. PRATT

DISPENSING MACHINE

Filed Jan. 4, 1926 4 Sheets-Sheet 1

Fig. 1.

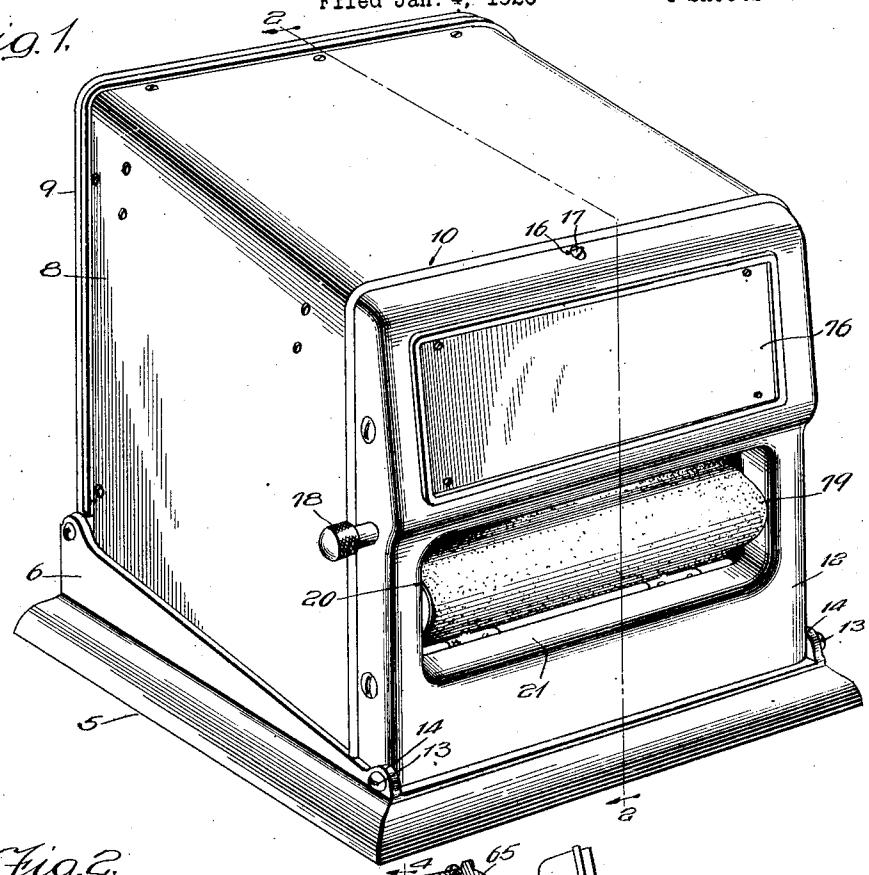


Fig. 2.

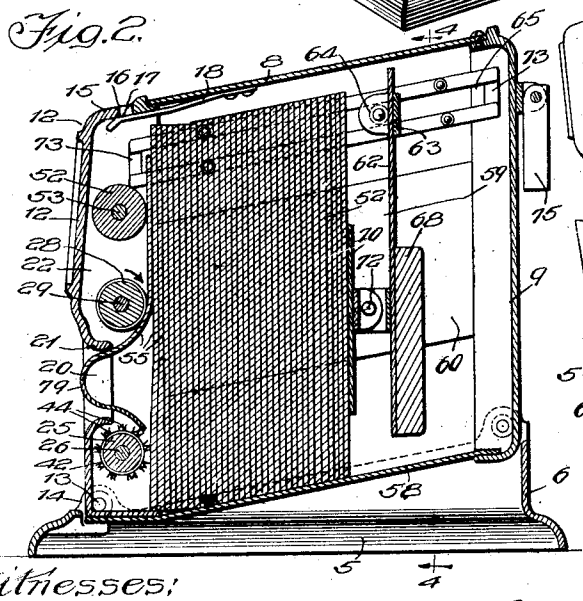
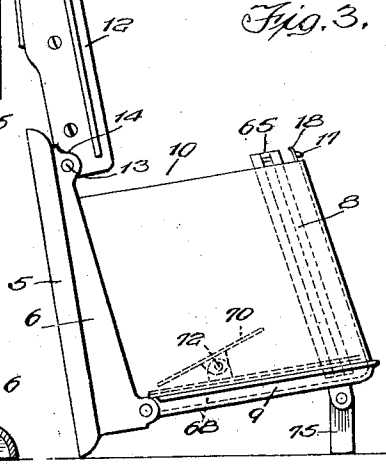


Fig. 3.



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Feb. 26, 1929. 1,703,594

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DISPENSING MACHINE

Filed Jan. 4, 1926 4 Sheets-Sheet 2

Fig. 4.

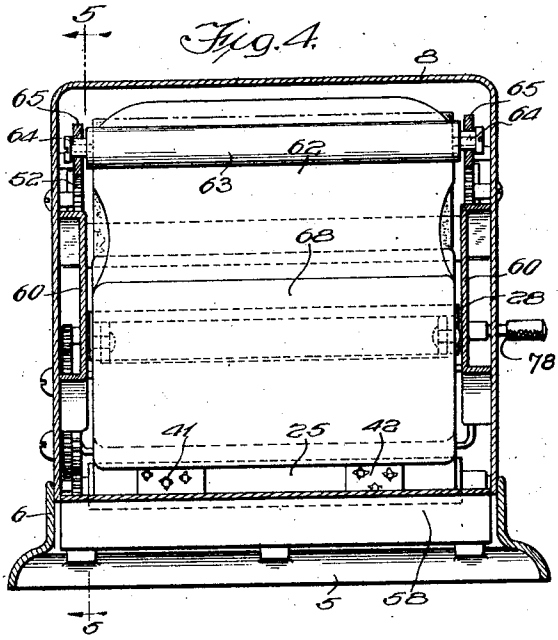


Fig. 5.

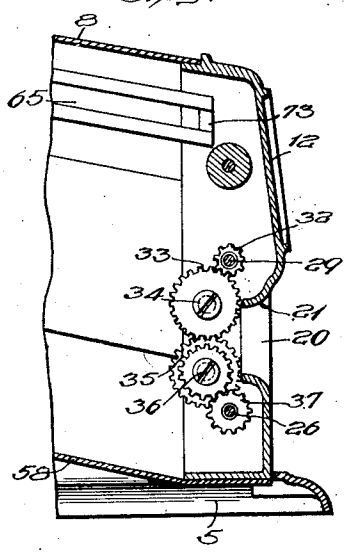


Fig. 10.

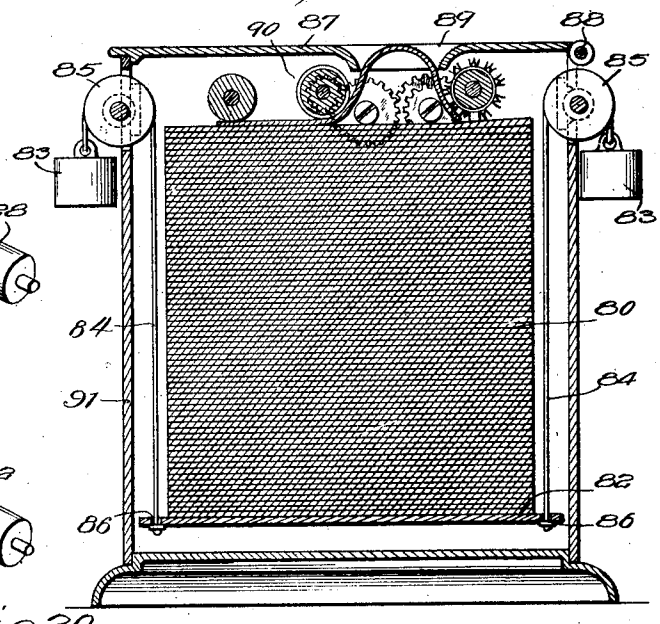


Fig. 6.

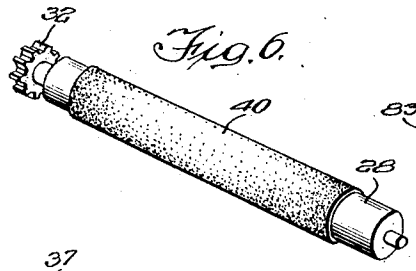


Fig. 7.

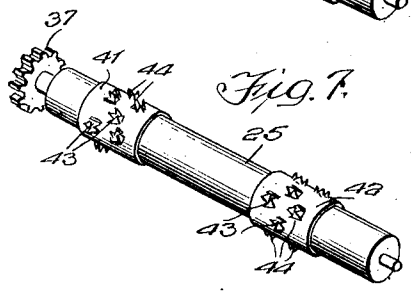
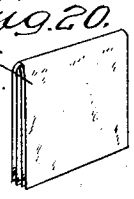


Fig. 20.



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Feb. 26, 1929. 1,703,594

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DISPENSING MACHINE

Filed Jan. 4, 1926 4 Sheets-Sheet 3

Fig. 11.

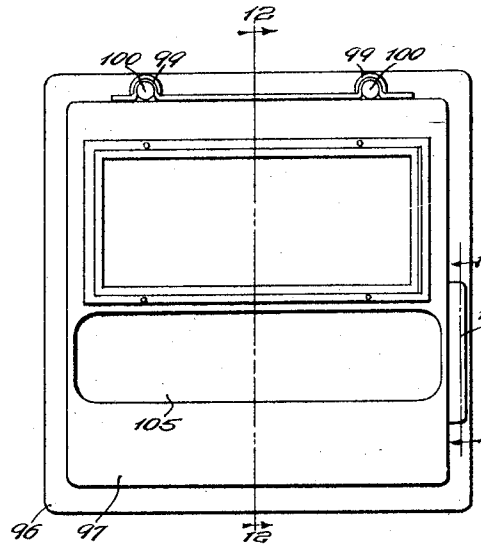


Fig. 12.

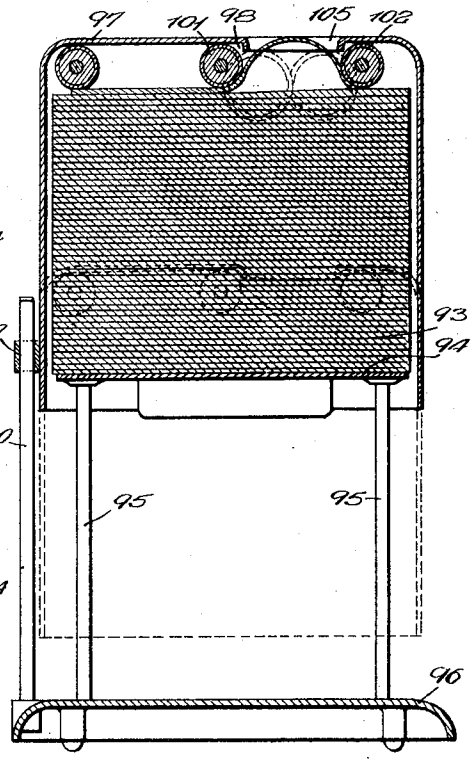


Fig. 13.

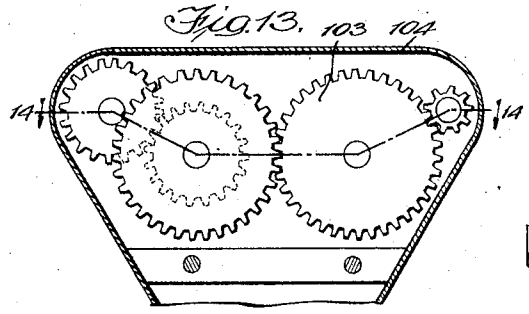


Fig. 14.

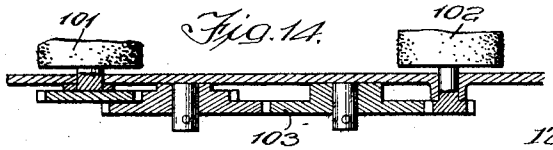


Fig. 8.

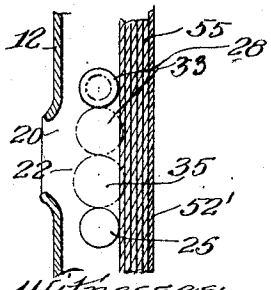


Fig. 19.

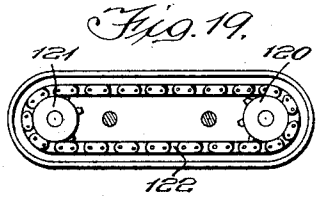
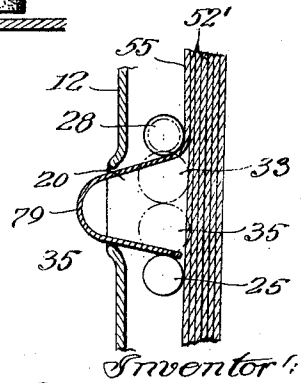


Fig. 9.



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Feb. 26, 1929. 1,703,594

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DISPENSING MACHINE

Filed Jan. 4, 1926 4 Sheets-Sheet 4

Fig. 15.

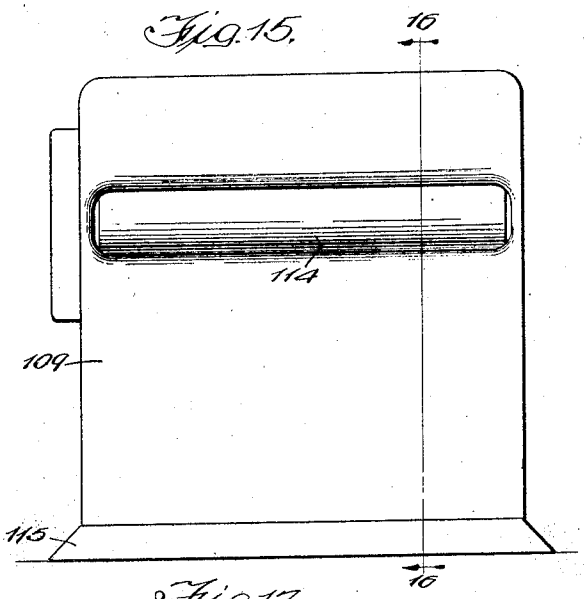


Fig. 16.

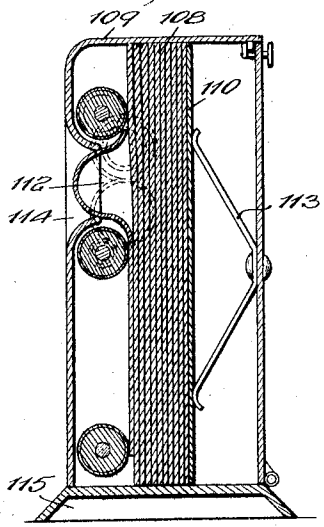


Fig. 17.

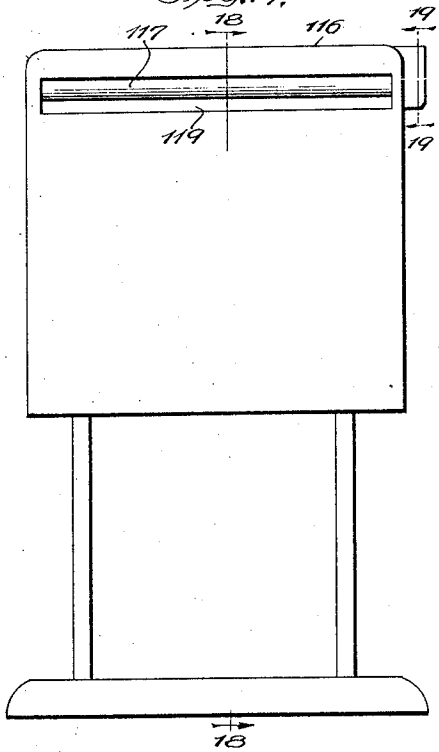


Fig. 18.

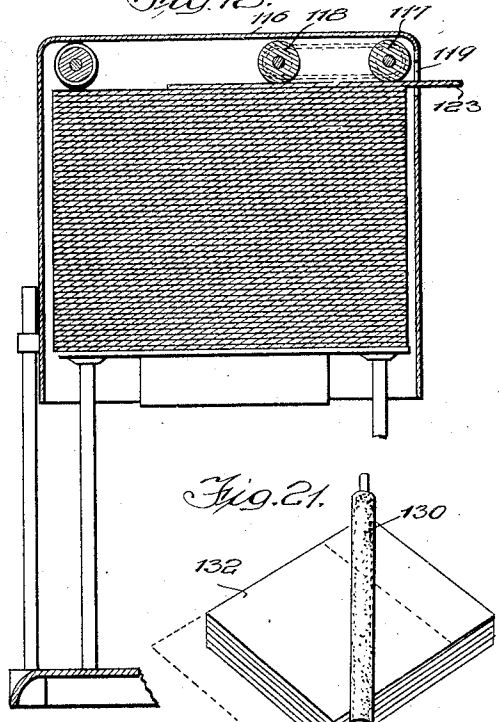


Fig. 21.

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Patented Feb. 26, 1929. 1,703,594

UNITED STATES PATENT OFFICE.

RAYMOND C. PRATT, OF CHICAGO, ILLINOIS.

DISPENSING MACHINE.

Application filed January 4, 1926. Serial No. 79,098.

This invention relates to dispensing machines, and more particularly to a dispensing machine that may be used for dispensing sheets of flexible material, such as paper napkins, towels, toilet paper and similar articles.

Devices of this sort in which the user has access to the entire pile or stack of sheets or to more than one at a time or in which there is any possibility of accidental or intentional withdrawing of more sheets than intended to be withdrawn at one time, are wasteful in use.

To provide for the user taking but one napkin, towel or the like at a time, machines have been provided for receiving a bundle or stack of sheets, so folded that a portion of the outermost sheet or article extends through or adjacent an outlet or discharge opening in the dispenser to be grasped and withdrawn by the user and with the articles or sheets so interfolded or interlapped that by withdrawing the outermost article, a portion of the next succeeding article is withdrawn through or positioned at the outlet, to be grasped and withdrawn later.

These latter devices require special folding, which is expensive and careful handling and packing into the machine is necessary to maintain their proper interfolded or interlapped relation. Also in these machines it is possible by one withdrawing operation to carry additional sheets with the outermost sheet, which is wasteful and unsatisfactory.

I find that in machines of this sort where to withdraw more sheets or articles than intended to be withdrawn in one operation, it requires an additional operation, the accidental or intentional withdrawing of more than necessary from the machine is minimized and economy in use of the articles is effected. At the same time, it is desirable that the outermost sheet or the sheets intended to be withdrawn in one operation be conveniently accessible and that the succeeding sheets be moved into position to be withdrawn with or by the withdrawal of said first sheets.

It is the object of my invention to provide a generally improved and simplified machine which will do this without requiring special folding of the articles and without requiring any particular or special packing or stacking of them in the machine.

Another object is to positively move the succeeding article into position for withdrawal, with the withdrawal of the outermost article.

Another object is to prevent accidentally or intentionally withdrawing from the machine, with one operation, more articles than intended to be withdrawn.

Another object is to provide for automatically maintaining the articles and dispensing means properly co-related from the first to the last article and for bringing the outlet and the succeeding outermost articles into proper relation successively with the withdrawal of the articles from the machine, and for exerting a constant pressure upon the stack or bundle of articles toward the dispensing means or the outlet of the machine.

To acquaint those skilled in the art with the manner of constructing and practicing the invention, I shall now describe several embodiments of the invention in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of one embodiment of the invention;

Fig. 2 is a vertical section taken on the line 2—2 of Figure 1;

Fig. 3 is a reduced side elevational view showing the manner of loading the machine of Figure 1;

Fig. 4 is a vertical section taken on the line 4—4 of Figure 2;

Fig. 5 is a fragmentary vertical section taken on the line 5—5 of Figure 4;

Figures 6 and 7 are persective views of the dispensing rollers;

Figures 8 and 9 show diagrammatically the manner of withdrawing the sheet and moving the next sheet into position to be withdrawn;

Fig. 10 is a vertical section, similar to Figure 2, of a modification;

Fig. 11 is a top plan view of another modification;

Fig. 12 is a vertical section taken on the line 12—12 of Figure 11;

Fig. 13 is a detail vertical section taken on the line 13—13 of Figure 11;

Fig. 14 is a detail horizontal section taken on the line 14—14 of Figure 13;

Fig. 15 is a front elevational view of another modification;

Fig. 16 is a vertical section taken on the line 16—16 of Figure 15;

Fig. 17 is a front elevational view of another modification;

Fig. 18 is a vertical section taken on the line 18—18 of Figure 17;

Fig. 19 is a detail vertical section taken on the line 19—19 of Figure 17;

Fig. 20 is a perspective view of one form of napkin which the present invention is adapted for handling; and

Fig. 21 shows diagrammatically another modification.

The device shown in Figures 1 to 9 inclusive, comprises a base 5 having upstanding sides 6 between which and within the base is mounted a casing 8 having a closed back 9 and an open front 10. The open front 10 is closed by a cover or door 12 hinged or pivoted at 13, 13 between lugs or ears 14 on the base 5.

For the purpose of latching the cover 12 in closed position over the open front of the casing, the upper inturned flange 15 of said cover is provided with an aperture 16 which is adapted to be sprung over and to receive a latch pin 17 which may be carried by a spring arm 18 anchored at its opposite end upon the top of the casing 8. To release this latch, a pin or other suitable implement is inserted through the opening 16 and the latch pin 17 pressed out of said opening whereupon the cover or door is free to be swung into open position about the pivots 13, 13.

The cover or door 12 is provided with a discharge or dispensing opening 20 extending transversely thereacross. The edges of the opening 20 may be finished as shown at 21 and adjacent the opening 20 is the dispensing mechanism designated generally at 22.

The dispensing mechanism comprises a roller 25 rotatably journalled at 26 in the cover 12 on one side of the outlet or opening 20. This roller 25 operates with the withdrawal of the outermost sheet or article to feed or move the succeeding sheet or article partially through or at least into position adjacent the opening 20 to be withdrawn the next time.

For the purpose of actuating or turning the roller 25 with the withdrawal of the outermost sheet, a second roller 28 is rotatably journalled at 29 in the cover 12 on the opposite side of the opening 20 and preferably substantially parallel with the roller 25. The roller 28 at all times engages only the outermost sheet and is turned in a clockwise direction (Fig. 2), by the withdrawal of the outermost sheet or article. Fixed on one end of the roller 28 to turn therewith is a relatively small pinion 32 which meshes with a relatively large idler gear 33 suitably journalled at 34 on the in-turned side flange of the cover 12. The gear 33 meshes with a similar idler gear 35 which may be of similar size and similarly journalled at 36 on the same side flange of the cover. The gear 35 meshes with a pinion 37 fixed on the roller 25 to turn the same therewith so that when the roller 28 is turned by the withdrawal of the outer sheet or article the roller 25 will be turned in the opposite direction through the gear train or driving connection therebetween.

For the purpose of increasing the frictional engagement between the outer sheet and the roller 28, said roller may be roughened at 40 as by gluing ground emery, carborundum or the like about the surface thereof, as shown. The roller 25 may be provided with roughened surfaces 41 and 42 for assuring proper dispensing engagement with the sheet or article. These surfaces 41 and 42 may comprise metal bands suitably attached peripherally about the roller 25 and provided with openings 43 struck up therefrom and forming relatively sharp upstanding prongs 44 for engagement with the article. Of course, the particular manner of roughening these rollers 25 and 28 may be varied, as desired, it being found preferable to make the roller 25 rougher than the roller 28, in the particular embodiment of the invention shown, because the inertia and friction which must be overcome in picking up and delivering the second or succeeding sheet through the opening is greater than that which must be overcome in the roller 28 in turning the same by the withdrawal of the outermost sheet.

The upper part of the stack or bundle 50 of the sheets or articles which may comprise napkins, towels or the like, is pressed against an idler roller extending like the rollers 25 and 28 transversely across the cover and journalled for free rotation at 53 in the opposite in-turned side flanges of the cover. The roller 52 preferably lies parallel with the rollers 28 and 25 and is positioned above the roller 28. It is merely an idling equalizing roller for holding the stack or bundle properly positioned in the machine and its surface need not be roughened. The body of the rollers 25, 28 and 52 may be conveniently formed of wood mounted upon suitable metal shafts, as shown, or this may be varied, as desired.

For the purpose of illustration, the articles or sheets are shown as the usual paper napkins 55 (Fig. 20), well known in the art. These napkins 55 are shown in Figure 20 as folded between their ends on lines of fold at right angles to each other to provide the usual quarter fold as well known in the art. This may be varied but it illustrates a standard fold and brings out that special folding or interlapping of the sheets is unnecessary in the case of articles other than that, since the fold will probably vary, but in any event a standard fold may be employed or the articles need not be folded at all.

The articles 55 are placed in a stack, pile or bundle 52′ and this bundle 52′ is placed behind the dispensing means and within the casing of the device, as shown in Figure 2. The particular disposition of the articles in the bundle is immaterial and there is no interlapping which must be maintained in plac-

ing them in the machine. It is preferable that their edges be in alignment, as shown.

For the purpose of pressing the articles forwardly toward the dispensing means 22, the bottom of the casing is inclined, as shown at 58 and a follower 59 is provided. The bundle 52′ is guided centrally within the machine toward the front between suitable side members or guides 60 which may be suitably attached internally to the side walls of the casing 8. The space between the guides 60 is just sufficient to receive the width of the bundle 52′.

The follower 59 comprises a plate member 62 which may be of substantially the contour of the folded napkin to fit between the top and bottom of the case 8 and for movement between the side members 60. The plate member 62 is carried adjacent its upper end by a transverse frame member 63, the opposite ends of which are turned at right angles and carry suitable pins or rollers 64 which operate in suitable inclined tracks 65, one mounted at each side of the casing 8. The tracks 65 are inclined toward the dispensing mechanism and the bottom of the follower plate member 62 is provided with a weight 68 which urges the follower forwardly toward the dispensing mechanism and thereby exerts a constant pressure upon the bundle 52′ and presses the forwardmost sheets or articles into cooperation with the dispensing mechanism.

The follower plate member 62 is provided with a shoe 70 pivoted to the plate member 62 at 72 and acting upon the rear of the bundle 52′ and thereby forming an equalizing member for equalizing the forward pressure imposed upon the bundle or stack 52′.

The tracks 65 may each comprise a pair of parallel sides with a space between them within which the rollers 64 operate and suitable pieces 73 at the ends of each track may limit the movement of the follower in opposite directions.

The tracks 65 may be mounted one upon each of the opposite side walls of the machine and their front ends preferably extend forwardly of the open front end 10. The rollers 64 may be mounted upon screws secured in the lateral ends of the frame member 63 and the heads of these screws may be on the outside and adapted to be exposed forwardly of the front end 10 of the casing 8 when the follower is at its forwardmost position. This permits removing these screws and mounting and removing the entire follower from the front open end 10 of the casing.

For the purpose of supporting the machine upon its back 9, as shown in Figure 3, said back 9 may be provided with a pivoted foot 75 which may normally hang in a vertical position, as shown in Figure 2. Supporting of the machine upon its back in this manner and opening the cover or front 12 facilitates loading or introducing the articles or bundle 52′ into the machine, whereupon the cover 12 may be closed and the machine set up on its base 5, for use. The outer surface of the front or cover 12 may have a space 76 for advertising matter or other indicia.

The operation of this embodiment of the invention is as follows:

With the bundle 52′ of sheets or articles 55 placed in the machine, as shown in Figure 2, the follower 59 compresses the bundle and presses the forwardmost sheet into cooperation with the rollers 25, 28 and 52 of the dispensing mechanism. For the purpose of facilitating the discharge of the first sheet, the roller 28 may be provided with an external finger piece 78 (Fig. 1). By grasping the finger piece 78 and turning the shaft 28 in the direction indicated by the arrow in Figure 2, the roller 25 will be driven in the opposite direction through the connecting gears and the first napkin will be gathered and looped or moved at 79 through the outlet 20 to be conveniently accessible and easily grasped for withdrawing from the machine.

This forms a gathering in much the manner of picking up a sheet by hand and the user grasps the portion of the sheet gathered through the opening 20 and pulls the same from the machine. In setting the first sheet for withdrawal, its lower edge is freed from the roller 25 and the succeeding sheet is brought into engagement therewith, as shown in Fig. 9. Then, by withdrawing the outermost sheet, the frictional engagement between that sheet and the roller 28 creates power which turns said roller 28 and in turn drives the roller 25 through the connecting gears. This rotation of the roller 25 in the opposite direction which accompanies withdrawal of the outermost sheet moves the succeeding or next sheet through the opening for withdrawal later and the lower part of the third sheet is brought into cooperation with the roller 25.

The withdrawal of the outermost sheet thus creates power in the dispensing mechanism which moves the succeeding sheet into position for withdrawal.

In Figure 10, the sheets are stacked vertically in the machine at 80 and are carried by an elevator 82 which is urged upwardly by weights 83. The weights 83 are secured upon flexible elements 84 trained over sheaves 85 and connected at their opposite ends at 86 to the carrier or elevator 82.

In this case, the cover 87 is disposed horizontally and pivoted or hinged at 88 and the outlet or discharge opening 89 is through the top of the machine. The dispensing mechanism shown in this embodiment is substantially the same as in the preceding embodiment but in this case, this dispensing mechanism 90 is carried by the casing 91 and not by the cover, as before.

In the embodiment of Figures 11 to 14, inclusive, the napkins or other articles are stacked vertically at 93 upon a table 94 mounted upon the upper ends of upright posts 95 carried by the supporting base 96.

In this case, the pile of articles 93 remains stationary and the cover 97 is carried by the engagement of the dispensing mechanism 98 carried thereby with the top of the stack of articles 93. The cover 97 has guide sleeves 99 guided upon vertical guide posts 100 and as the articles are dispensed or withdrawn from the machine, the cover drops by gravity to maintain proper engagement of the uppermost articles with the dispensing mechanism. The gear mechanism between the dispensing rollers 101 and 102 is shown at 103 mounted in a lateral pocket 104 in one side of the cover 97. The outlet or discharge opening is indicated at 105.

In the embodiment of Figures 15 and 16, the articles 108 are stacked edgewise vertically in the casing 109 with a follower 110 behind them which is pressed forwardly toward the dispensing mechanism 112 by a spring 113. The outlet is indicated at 114 and the supporting base at 115.

In the embodiment of Figures 17, 18 and 19, the articles are supported substantially as shown in Figure 12 and the cover 116 drops by gravity in substantially the same manner. In this case, however, the outlet is through the side of the cover at 119 and the dispensing rollers 117 and 118 are provided with sprockets 120 and 121 (Fig. 19), over which a chain 122 is trained and drivingly connects the rollers. When the uppermost sheet 123 is withdrawn, it remains in engagement with the roller 117 after leaving the roller 118 and the roller 118 engages the succeeding sheet with the roller 117 in engagement with the uppermost sheet. The withdrawing of the sheet turns the roller 117 and this creates power which turns the roller 118 in the same direction which moves or impels the succeeding sheet partially through the opening 119 to be grasped and withdrawn later.

In Figure 21, I have shown one manner of employing a single roller 130 for taking the power from the sheet being withdrawn and imparting it to the succeeding sheet to move it into position to be withdrawn. The direction of withdrawal of the sheet 132 is indicated by the direction of displacement shown in dotted lines and by arranging the roller 130 diagonally across the top of the stack when the uppermost sheet 132 is withdrawn partially, for example, to the position shown in dotted lines, the roller 130 will engage both the uppermost sheet and the succeeding sheet so that upon being turned by the uppermost sheet it will in turn, by its frictional engagement with the next sheet, move the same into position for withdrawal from the machine.

In the embodiment of Figures 1 to 9, there may be a gear reduction between the rollers 28 and 25 for the purpose of driving the roller 25 slower than the roller 28 and assuring a positive looping of the lower end of the second napkin or other article out through the opening 20. I find a three to one reduction suitable for this purpose, but this may, of course, be varied. This feature may also be embodied in the other forms of the invention.

I do not intend to be limited to the precise details shown or described.

I claim:—

1. In a machine of the class described, the combination of a receptacle for a stack of flexible folded sheets, said receptacle having an outlet, a pair of dispensing rollers mounted within the receptacle in proximity to said outlet and comprising a first roller located on one side of said outlet and a second roller located on the opposite side of said outlet, said rollers having a relatively large space between them to permit a folded sheet to be gathered and looped loosely through the outlet without buckling and without additionally folding the sheet, means for supporting the sheets off-center with respect to said rollers so that in withdrawing the outermost sheet one margin thereof will leave the second roller to permit said second roller to engage the next succeeding sheet before the other margin of the outermost sheet leaves the first roller whereby said first roller is turned by engagement with the outermost sheet after said sheet is freed from the second roller, and a driving connection between said rollers for looping the edge of the succeeding sheet adjacent said second roller out through said outlet simultaneously with the withdrawal of the opposite edge of the outermost sheet.

2. In a machine of the class described, the combination of a receptacle for a stack of flexible folded sheets, said receptacle having an outlet, a pair of dispensing rollers mounted within the receptacle in proximity to said outlet and comprising a first roller located on one side of said outlet and a second roller located on the opposite side of said outlet, said rollers having a relatively large space between them to permit a folded sheet to be gathered and looped loosely through the outlet without buckling and without additionally folding the sheet, means for supporting the sheets off-center with respect to said rollers so that in withdrawing the outermost sheet one margin thereof will leave the second roller to permit said second roller to engage the next succeeding sheet before the other margin of the outermost sheet leaves the first roller whereby said first roller is turned by engagement with the outermost sheet after said sheet is freed from the second roller, a driving connection between said rollers for looping the edge of the succeeding sheet adjacent said second roller out through said outlet simultaneously with the

withdrawal of the opposite edge of the outermost sheet, a third roller journaled idly on the side of the outlet with said first roller, means for urging the sheets into cooperation with said rollers, said last means comprising follower means gravitating on an inclined track toward said outlet and pressing the articles toward said rollers, and an equalizer pivoted to said follower and acting upon the articles to impose pressure of said follower uniformly thereon.

3. In a machine of the class described, the combination of a receptacle for a stack of flexible folded sheets, said receptacle having an outlet, a pair of dispensing rollers mounted within the receptacle in proximity to said outlet and comprising a first roller located on one side of said outlet and a second roller located on the opposite side of said outlet, said rollers having a relatively large space between them to permit a folded sheet to be gathered and looped loosely through the outlet without buckling and without additionally folding the sheet, means for supporting the sheets off center with respect to said rollers so that in withdrawing the outermost sheet one margin thereof will leave the second roller to permit said second roller to engage the next succeeding sheet before the other margin of the outermost sheet leaves the first roller whereby said first roller is turned by engagement with the outermost sheet after said sheet is freed from the second roller, a driving connection between said rollers for looping the edge of the succeeding sheet adjacent said second roller out through said outlet simultaneously with the withdrawal of the opposite edge of the outermost sheet, a third roller journaled idly on the side of the outlet with said first roller, means for urging the sheets into cooperation with said rollers, said receptacle comprising a casing having a removable cover, said first, second and third rollers being carried by the cover and removable and replaceable as a unit therewith, said last means comprising follower means gravitating on an inclined track toward said outlet and pressing the articles toward said rollers, an equalizer pivoted to said follower and acting upon the articles to impose pressure of said follower uniformly thereon, and a leg pivoted to said back and adapted for supporting said casing on its back with the open side thereof upwardly disposed for loading the machine.

4. In a machine of the class described, the combination of a receptacle for a stack of flexible folded sheets, said receptacle having an outlet, a pair of dispensing rollers mounted within the receptacle in proximity to said outlet and comprising a first roller located on one side of said outlet and a second roller located on the opposite side of said outlet, said rollers having a relatively large space between them to permit a folded sheet to be gatered and looped loosely through the outlet without buckling and without additionally folding the sheet, means for supporting the sheets off-center with respect to said rollers so that in withdrawing the outermost sheet one margin thereof will leave the second roller to permit said second roller to engage the next succeeding sheet before the other margin of the outermost sheet leaves the first roller whereby said first roller is turned by engagement with the outermost sheet after said sheet is freed from the second roller, a driving connection between said rollers for looping the edge of the succeeding sheet adjacent said second roller out through said outlet simultaneously with the withdrawal of the opposite edge of the outermost sheet, a third roller journaled idly on the side of the outlet with said first roller, means for urging the sheets into cooperation with said rollers, said receptacle comprising a casing having a removable cover, said first, second and third rollers being carried by the cover and removable and replaceable as a unit therewith, said last means comprising follower means gravitating on an inclined track toward said outlet and pressing the articles toward said rollers, an equalizer pivoted to said follower and acting upon the articles to impose pressure of said follower uniformly thereon, a leg pivoted to said back and adapted for supporting said casing on its back with the open side thereof upwardly disposed for loading the machine, a hinge connection between the cover and the casing, and a spring arm secured to the casing and provided with a pin engageable in an aperture in the cover to latch said cover in closed position.

In witness whereof, I hereunto subscribe my name this 2nd day of January, 1926.

RAYMOND C. PRATT.