Nov. 3, 1925. 1,560,113

B. K. SANDALJIAN

AUTOMATIC SHEET STACKING MACHINE

Filed Feb. 11, 1924 4 Sheets-Sheet 1

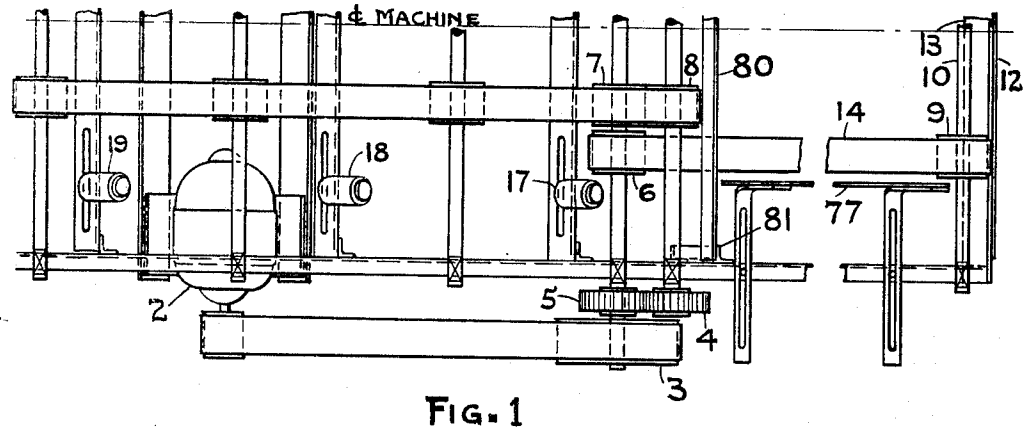


FIG. 1

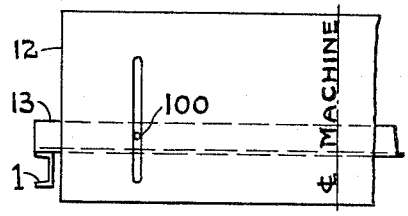


FIG. 10

FIG. 2

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AUTOMATIC SHEET STACKING MACHINE

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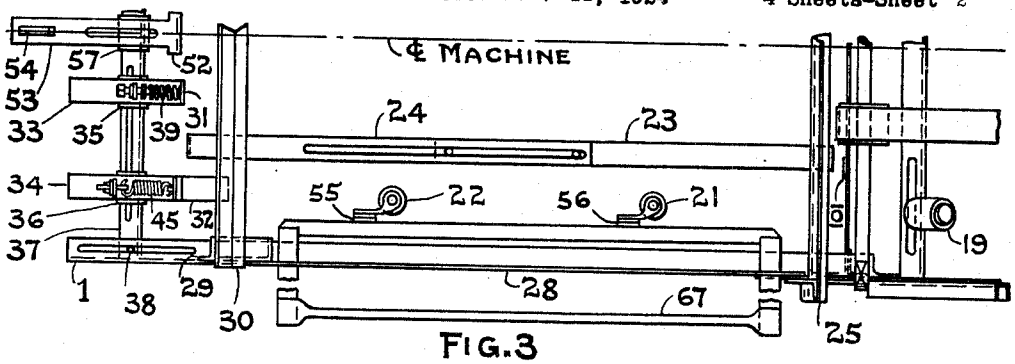


FIG. 3

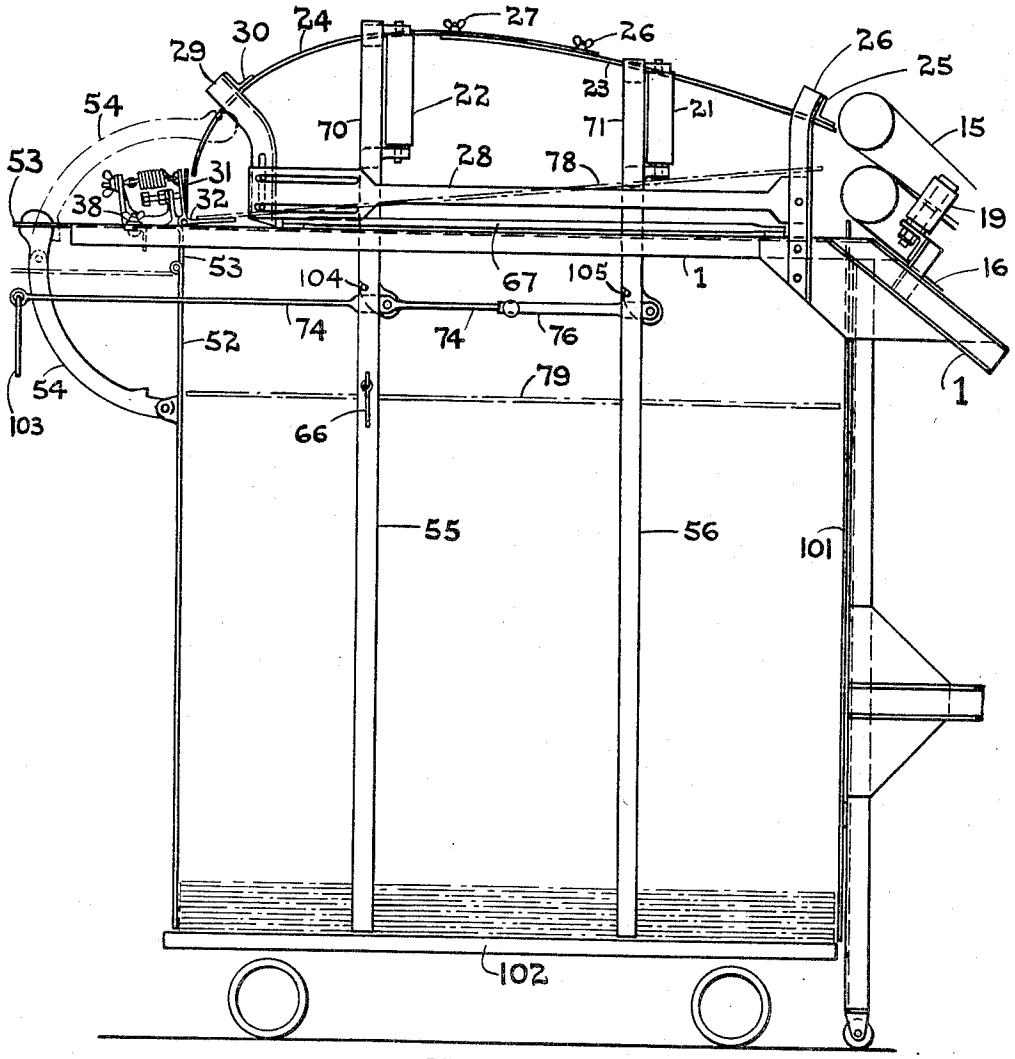


FIG. 4

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AUTOMATIC SHEET STACKING MACHINE

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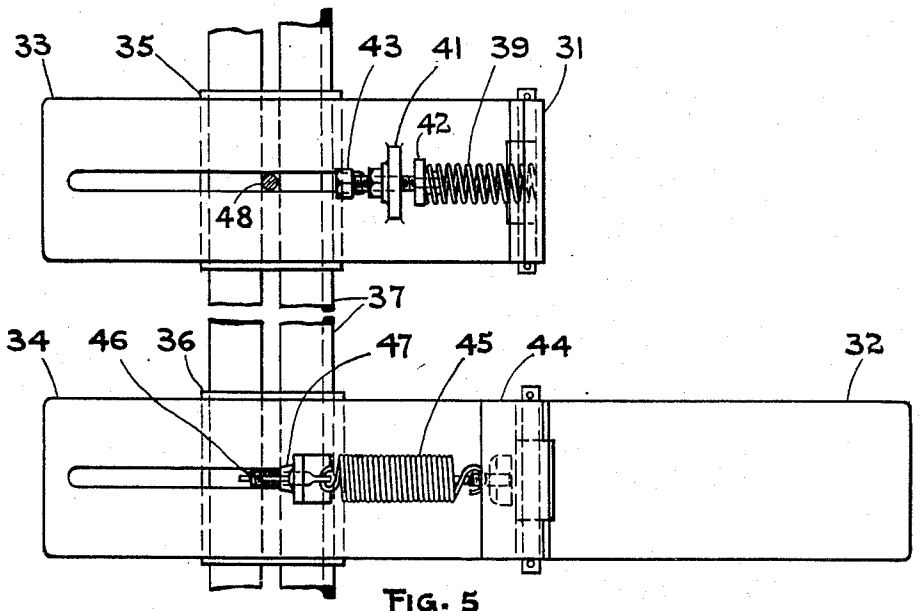


FIG. 5

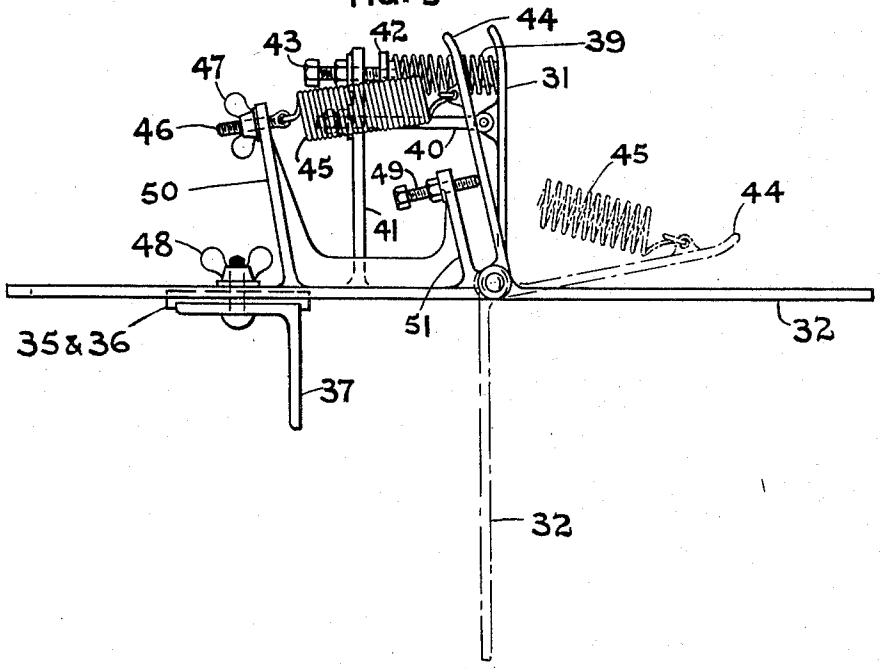


FIG. 6

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AUTOMATIC SHEET STACKING MACHINE

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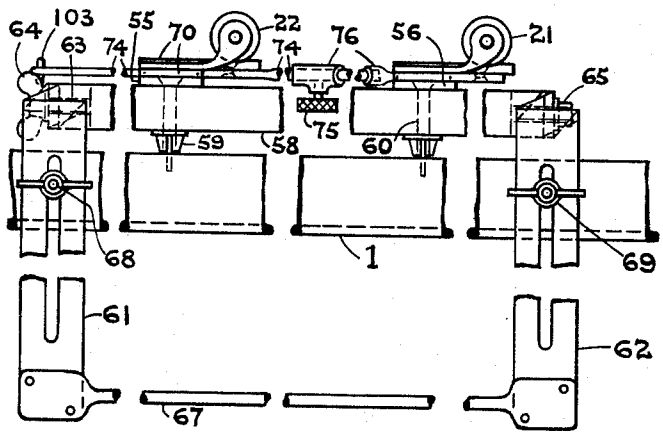


FIG. 7

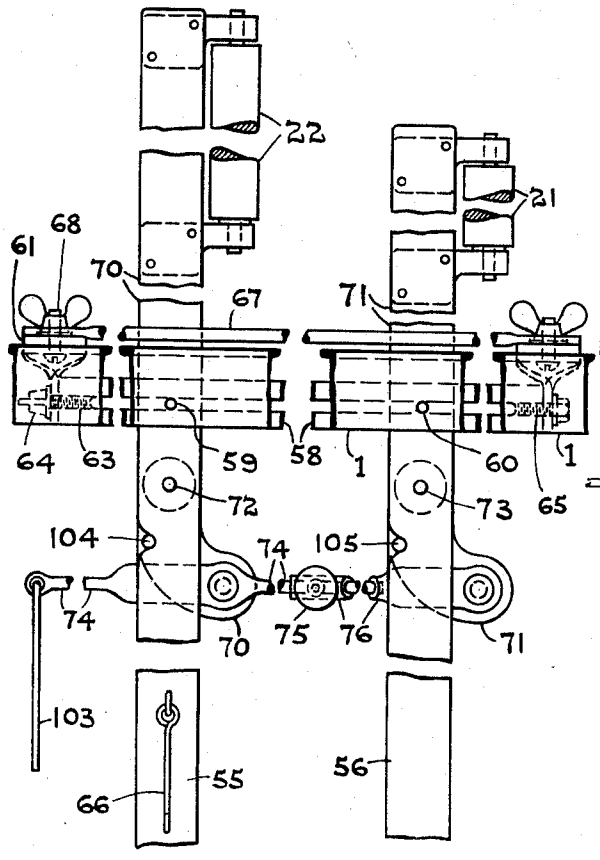


FIG. 8

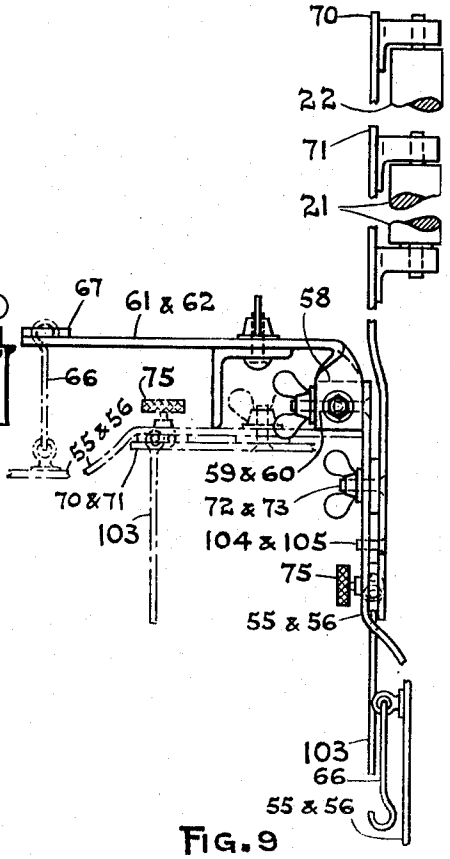


FIG. 9

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Patented Nov. 3, 1925. 1,560,113

UNITED STATES PATENT OFFICE.

BEDROS K. SANDALJIAN, OF GROTON, CONNECTICUT.

AUTOMATIC SHEET-STACKING MACHINE.

Application filed February 11, 1924. Serial No. 691,995.

To all whom it may concern:

Be it known that I, BEDROS K. SANDALJIAN, a citizen of the United States, residing at Groton, in the county of New London and the State of Connecticut, have invented a new and useful Automatic Sheet-Stacking Machine, of which the following is a specification, reference being made therein to the accompanying drawings.

This invention relates broadly to a machine for automatically piling sheets of various substances, such as plain or corrugated—combined paper board, celluloid, rubber, fibre, wooden or metallic sheets, etc., of various sizes, and thicknesses, and specifically to a self contained automatic machine for receiving continuously sheets, emerging continuously from another mechanism, conveying, raising, dropping and piling same in an even stack to any required height on a receptacle, suspending the said sheets while said loaded receptacle is being changed without interrupting the continuity of the reception of the emerging sheets from the preceding mechanism.

The primary object of this invention is to provide a machine for continuously receiving sheets of various substances, to convey them to a receptacle replaceable by others, without interrupting the reception of the sheets during the replacement operations.

A further object is to provide a machine of the character mentioned, primarily designed to receive continuously sheets as described, to convey them to a receptacle replaceable by others, to suspend them during the time that the receptacle is replaced without interrupting the continuity of the reception of the sheets.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a half plan view of the conveyor section of the machine, the other half being similar, except the motor, the driving pulleys and gears which do not exist in the other half.

Fig. 2 is a side elevation of the same section.

Fig. 3 is a half plan view of the stacking section of the machine, the other half is similar.

Fig. 4 is a side elevation of the stacking section.

The entire machine can be seen as a whole by placing Figures 1 and 3 end to end, and Figs. 2 and 4 end to end.

Fig. 5 is a plan view of the regulating device.

Fig. 6 is a side elevation of the cushion and the regulator in one view.

Fig. 7 is a plan view of the adjustable side piles and the sheet receiving device.

Fig. 8 is a side elevation of Fig. 7.

Fig. 9 is an end elevation of same.

Fig. 10 is an end elevation of stop 12.

The whole machine is constructed on a rigid frame indicated by the numeral 1 on various views, mounted on casters, thus making it portable, if so desired, or fastened to the floor by omitting the casters, if permanently located. The conveyor is driven by a variable speed motor 2 or through some other variable speed motive power, thus making it a self-driven and self-contained unit, ready to apply to any machine delivering sheets.

In Figs. 1 and 2, motor 2 drives pulleys 3, 6 and 7, and, through gears 4 and 5, drives pulley 8, thus driving the belting of any suitable material and construction, of the whole conveyor system at the proper speed, giving the necessary momentum to the sheets to carry them through the space over the stacker, until their forward ends hit cushion 31 (Fig. 3 and Fig. 4) and their fall retarded by regulator 32 until their after end reaches the same level, when the regulator releases the forward ends and the sheets fall down flat on receptacle, herein shown as a truck, but can be substituted by a receptacle of another fabricating machine, performing further operations on the sheets.

In Figs. 1, 2 and 10, pulley 9 is mounted on shaft 10, and supported by adjustable brackets 11, which can be raised or lowered to suit the height of the sheet delivering machine. Likewise, stop 12 can be raised or lowered through its slots and fastened to frame 13 herein shown by set screws 100.

When operating, the conveyor end of the machine (Figs. 1 and 2) is brought near or under the frame of the delivery end of the fabricating, printing or finishing machines from which the sheets fall on belts 14, and

are carried to and picked by belts 15 and 16, guided sidewise by adjustable plates 77 and rollers 17, 18, 19 (and 21 and 22, in Figs. 3 and 4), to suit the various widths of the sheets and are carried up with necessary speed and thrown over the stacking space.

In Figs. 3 and 4 the top guides 23 and 24 are made of flexible material and are readily adjustable to any convenient curvature necessary to guide the various sizes and weights of sheets, strap 23 is attached to frame 25, which is supported by stand 26, which in turn is fixed to main frame 1, slotted strap 24 is attached to strap 23 by thumb screws 26 and 27, and they can be shortened or lengthened to suit lengths of sheets. To stands 26 are attached slotted side plates 28; to these slots are attached stands 29, which rest on main frame 1 and carry frame 30, to which are attached straps 24, with curved ends pointing to the cushions; stand 29 can be moved back and forth in the slots to suit the length of the sheets, also they can be rocked to give the desired curvature.

After the sheets are thrown by double belts, 15 and 16, through guides 21, 22, 23 and 24, they hit cushions 31, spending their momentum on them, which rebound and let the end of the sheet fall on regulator flappers 32, which retard the fall of the forward end of the sheet until the after end reaches the same level, then it lets the sheet fall down in a horizontal position between the adjustable end and side piles 52, 55 and 56. Sheet 78 is shown just falling on the regulator, and 79 falling down in a horizontal position.

In Figs. 5 and 6 both cushion 31 and regulator 32 are hinged to slotted brackets 33 and 34 which rest in saddles 35 and 36, which in turn rest on slotted frame 37, and are secured to it by thumb screws 48, thus providing them forward and backward and crosswise adjustments; in addition to these small forward and backward adjustments, frame 37 can be moved back and forth in slots in frame 1, Fig. 3, to which it is secured by thumb screw 38, to suit length of sheets. In Figs. 5 and 6, cushion 31 is held against compression spring 39 by adjustable hinge bolt 40. Spring 39 is held between cushion 31 and collar 42, which is adjusted by set screw 43, and both 40 and 43 are secured to upright 41, which is integral with 33. The impact of the sheet forces cushion 31 against spring 39, thus compressing it, but as the momentum is spent, the spring rebounds, guiding sheet down to retarder 32, which is integral with 44 and is hinged to 34 and held in position by tension spring 45, one end of which is hooked to 44 and the other to 46, and adjusted by wing-nut 47 and by set screw 49; uprights 50 and 51 are integral with 34. The spring 45 is so designed and adjusted that the weight of the forward end of the sheet forces 32 and 44 to the positions shown by dot and dash lines, thus regulating the fall of the forward end of the sheet until the after-end reaches the same relative height, so letting the sheets fall down level between side and end piles 55, 56, 52 and 101 (Figs. 3 and 4) to the top of receptacle of next fabricating machine.

In Figs. 3 and 4, the end pile 52 is hinged to 53, which also rests on a saddle 57; it has only one adjustment, forward and backward, a catch 54 is hinged to 52, the upper end of 54 has a jaw about the thickness of 53, which it engages when pile is in its downward position. When the pile is wanted to be raised up for removing the receptacle, catch 54 is pushed back, releasing the jaw from 53, and when the pile 52 is raised to a horizontal position, 54 slides up in the slot of 53, then the lower notch engages the back of slot in 53, force of gravity locking it in that position, as shown in dot and dash lines.

In Figs. 7, 8 and 9, side piles 55 and 56 are attached to the slotted bar 58 by means of thumb screws 59 and 60, the slotted bar at one end is pivoted to the end of frame 62 by means of screw 65, and at the other end is pivoted to the end of frame 61 by means of 63, and held in position by tightening the thumb screw 64. When side piles 55 and 56 are wanted to be lifted, the thumb screw 64 is loosened, side piles swung up, and hook 66 hung over 67, side piles 55 and 56 can be located anywhere in the slot of 58 to suit the length of the sheets, and they can also be brought nearer to the center line of machine or moved further out to suit the width of sheets by loosening the thumb screws 68, and 69, and pushing in and pulling out frames 61 and 62 by the grab rod 67. The upper extension of the side piles 55 and 56 carry guide rollers 21 and 22.

In the course of replacing the receptacle under the stacking device, I have provided two ways of taking care of the proceeding sheets from the delivering machine; the simplest way is to switch off the motor, thus stopping the conveyor and letting the sheets pile on belt 14, and against stop 12 (Figs. 1 and 2) until the loaded receptacle is changed, then starting the conveyor, catch 80 is fastened to uprights 81, which have slots in their lower ends, through which they can be raised or lowered and fastened to frame 1 by set screws, catch 80 can be adjusted so that it will let only one sheet pass under it.

But where this is not practicable, I have devised another means to take care of the emerging sheets from the double belt conveyor without stopping it.

As soon as the end pile 52 (Fig. 4) is raised up and the side piles 55 and 56 (Figs. 7 and 8) are swung up and hooked to the grab rod 67, rollers 21 and 22, which are pivotally attached to frames 70 and 71, take

a horizontal position above the sheet stack to receive the sheets from the conveyor, then the sheets begin to collect on rollers 21 and 22, while the loaded receptacle is being removed, as soon as the empty receptacle is brought under the rollers 21 and 22, frames 70 and 71 are pulled off by handle 103, drawing them away entirely from under the sheets, thus letting down on the receptacle all the collected sheets, then side and end piles are dropped down, rollers 21 and 22 pushed back to their vertical position to serve as guides to the sheets delivered from the conveyor, and the operation repeated.

Rod 74 telescopes in tube 76, and is fastened together by 75 to allow adjustment for the side piles.

Some changes may be made in the construction and arrangement of the parts of my machine without departing from the essential features and purposes of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

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

1. In a machine of the class described, means for continuously receiving sheets, means for conveying said sheets, means for interrupting the passage of the sheets, a receptacle for the sheets, means for stacking the sheets upon the receptacle and means for suspending the sheets when the receptacle is to be replaced.

2. In a machine of the class described, means for continuously receiving sheets, means for conveying said sheets, means for interrupting the passage of the sheets and changing their direction, a receptacle for the sheets, means for stacking sheets upon the receptacle, and means for suspending the sheets when the receptacle is to be replaced.

3. In a machine of the class described, means for receiving sheets, means for conveying them, means for suspending them in passing through the machine, a replaceable receptacle for the sheets, means for releasing the suspended sheets, and means for guiding the sheet down to the receptacle.

4. In a machine of the class described, a continuously receiving means, a conveying means, a guiding means for changing the direction of the sheets, stopping means interrupting the passage of the sheets, means for moving the sheets into a substantially horizontal position, guiding members for stacking the sheets in an even pile, a receptacle for the sheets, and means to be interposed in the path of the sheets for suspending the sheets on their way to the receptacle, and means for releasing the interposed suspending means at will.

BEDROS K. SANDALJIAN.