May 29, 1934. R. J. HUTT ET AL 1,960,667

DEVICE FOR STACKING SHEET MATERIAL

Filed Aug. 1, 1931 2 Sheets-Sheet 1

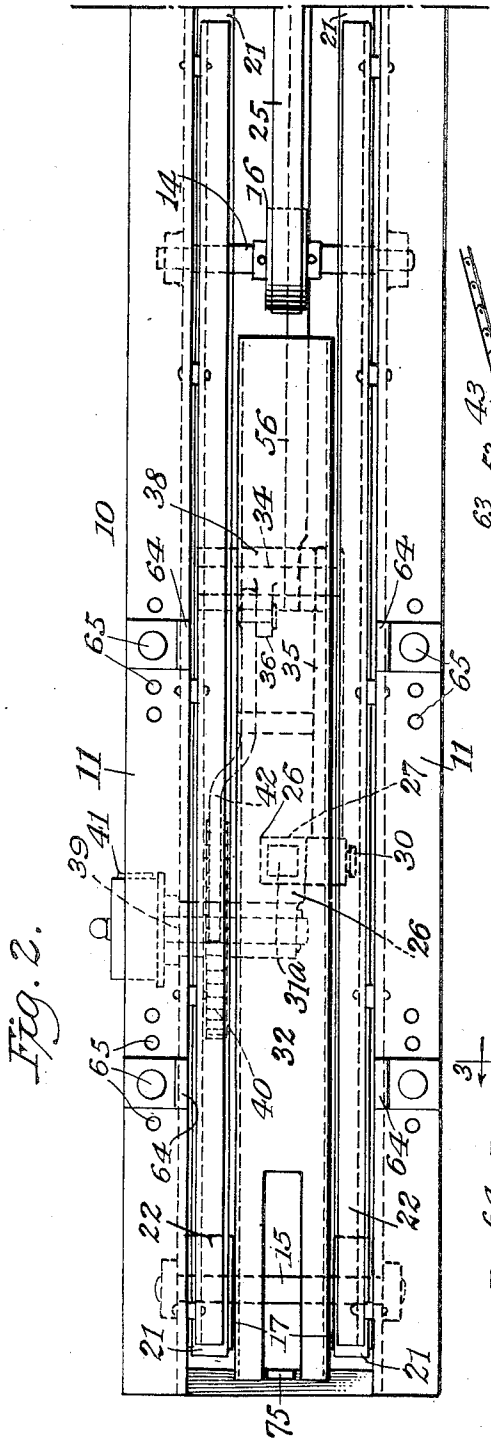


Fig. 2.

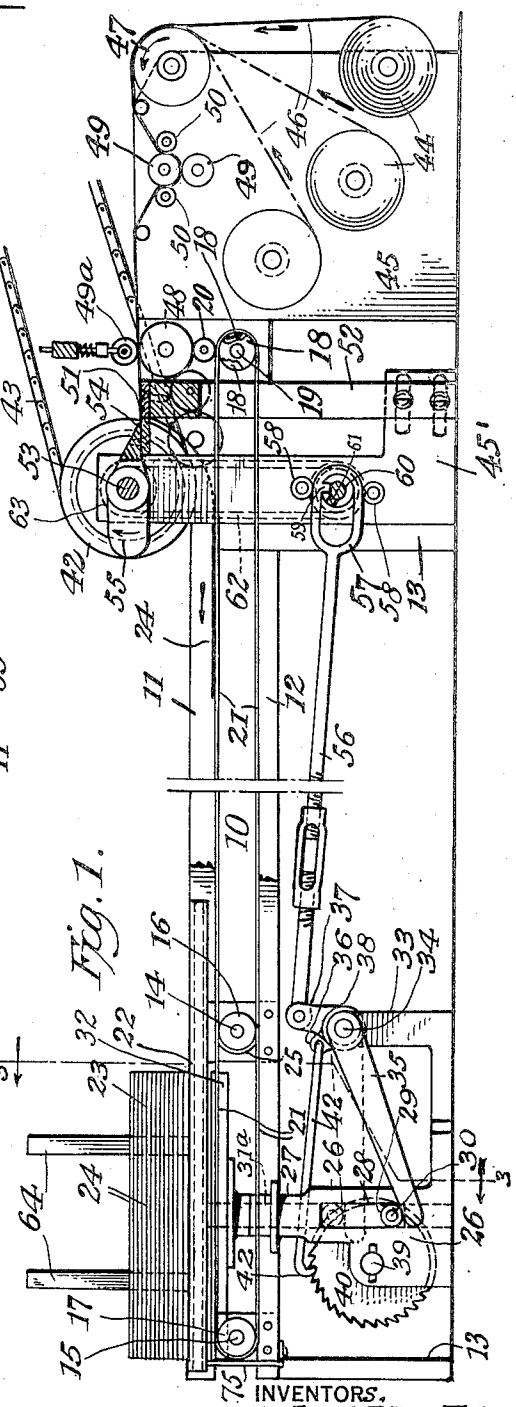


Fig. 1.

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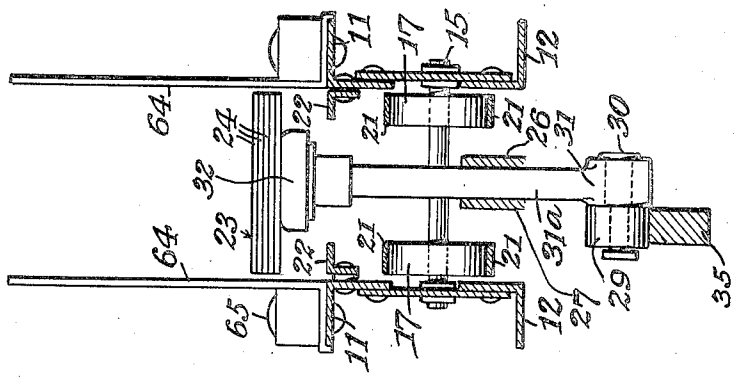


Fig. 5.

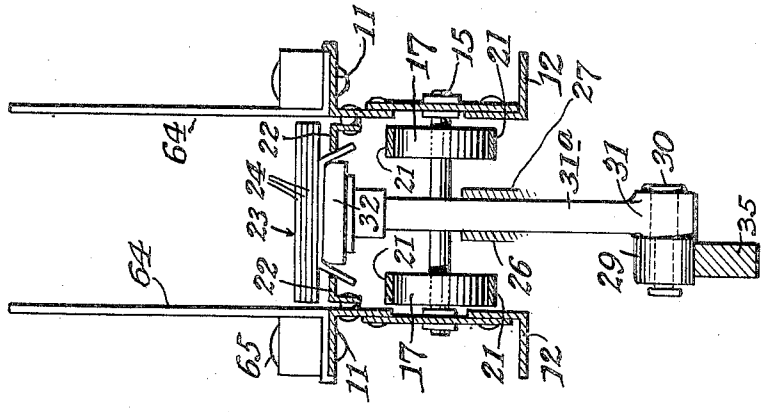


Fig. 4.

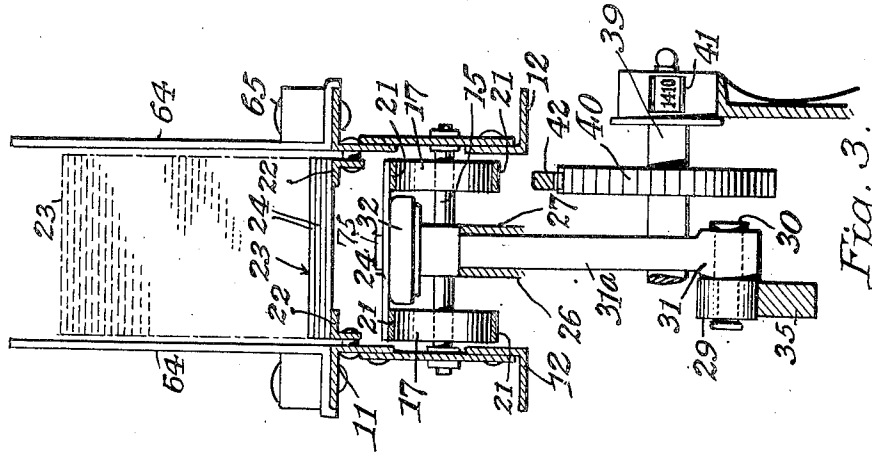


Fig. 3.

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UNITED STATES PATENT OFFICE

1,960,667

DEVICE FOR STACKING SHEET MATERIAL

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Application August 1, 1931, Serial No. 554,510

2 Claims. (Cl. 271—87)

This invention relates generally to paper handling mechanism, and more particularly to a machine for cutting determined lengths from running paper webs; for stacking said web lengths, and for counting said lengths in the stacking operation; the stacks being formed in a convenient position from which the operator may remove them successively when the counter index designates the "count" desired, after which another stack is counted and formed automatically over and over in the operation of the machine in rapid succession.

Accordingly, the object of my invention is to provide operative means for feeding a strip or web of paper or other desired material, or two or more of said strips or webs in superposed relation through the machine, providing means for cutting said strips to lengths, providing means for stacking said strips and providing means for counting said strips in the stacking operation.

The invention possesses other advantageous features, which with the foregoing, will be set forth at length in the following description where we shall outline in full, that form of the invention which we have selected for illustration in the accompanying drawings.

The novelty of the invention will be included in the claims succeeding said description.

It will be understood that we do not limit ourselves to the showing made in the drawings herewith as many variations may be adopted within the scope of the invention claimed.

In the drawings illustrating what we now consider a satisfactory form of machine for cutting, counting and stacking paper lengths;

Fig. 1 is a more or less diagrammatic side elevation of the machine with parts omitted and parts in section and broken away to better disclose the construction.

Fig. 2 is a greatly enlarged top or plan view of the front portion of the machine which clearly shows the belts, frame work, counter device and other elements of the structure.

Fig. 3 is a cross-sectional elevation on about the line 3—3 of Fig. 1, but on a larger scale clearly showing an incoming sheet in position to be lifted against the bottom sheet of the stack between supporting side bars, said sheet being counted as it is raised to the underside of said stack.

Fig. 4 is a similar view but showing the opposite side or longitudinal edges of the incoming sheet turned backwardly as an elevator table forces said sheet upwardly and against the counted stack resting on the supporting side bars on which it is normally supported. The upward movement of this table being such as to raise the counted stack with the newly added sheet to an extent permitting the said turned back edges of said incoming sheet to snap outwardly under the stack, and to rest on the said side supporting rails or bars when the stack is lowered by the recession of the table as will be later described.

Fig. 5 is a view similar to Fig. 4 but with the stack supporting table raised to its limit and with the edges of the lower new sheet of the stack snapped out to the normal position.

The machine for accomplishing the above described results and as illustrated in the accompanying drawings, may consist of a frame 10, largely of riveted stock angle pieces for economy, and said frame preferably embodies a longitudinal structure of upper and lower side angle pieces 11 and 12 and end supports 13; and revoluble on cross pins or shafts 14 and 15 are free running pulleys or rollers 16 and 17, which are driven by side and central pulleys 18, affixed to a drive shaft 19, in operative engagement with suitable driving gears 20, one only being shown, and in any suitable manner, and at a determined speed.

As best shown in Fig. 2 of the drawings, there are two horizontal paper strip conveying belts 21, preferably operating along the inner sides of the upper side frame pieces 11, and under the side supporting bars 22, upon which successively counted stacks 23 of paper or other strips 24, rest, in the counting and building up of said stacks.

The third or central belt 25, is carried, at its forward end, on the pulley 16 mounted intermediate the length of the frame 10 and on one of three pulleys 18 on the drive shaft 19, as in Fig. 1.

In further carrying out our invention we locate at the front of the machine, a casting 26, embodying at its forward portion a hollow standard or guide portion 27, having formed in one side thereof a vertical slot 28, in which may operate a projecting roller 29, revoluble on an outward or backwardly extending pin 30, which extends forwardly through the slot 28 and through the lower end 31 of a shank or leg 31*a* of an elevator table 32 having connections whereby it may be elevated and lowered at determined intervals corresponding to the feeding speed imparted to the sheets of paper delivered to the machine for counting and stacking said sheets on said elevator table as will hereinafter appear.

Located rearwardly of the main casting 26, is a suitable post 33, having a cross pin 34 extending across through its top portion; and affixed to

rock with this cross or bearing pin 34 are three rock arms to be hereinafter designated respectively as follows: a table elevating arm 35, a counter connected arm 36, and a tripper connecting arm 37; said arms preferably formed with a common hub 38.

Journalled in the casting 26 forwardly of the vertical slot 28, is a preferably horizontal shaft 39 on which a toothed wheel 40 is affixed and contacting progressively with the teeth 41, thereon is a gravity hook dog link 42, pivoted to the short arm 36, through which the toothed wheel 40 and its shaft 39 is imparted rotary intermittent movements each equal to the space between the teeth so that such rotary step movements may be successively transmitted to the usual mechanism of a counting machine 41, which is conveniently located for such connection, and in the practice of the invention, when a determined number of sheets have been counted and stacked, the operator may remove said counted stack from the supporting bars 22 between the vertical operations of the table; thus no time is lost.

The feed mechanism preferably may be driven by a sprocket 42 and a chain 43 from a suitable source of power, not shown, and may take various forms. In the form shown, we illustrate a number of paper strip supply rolls 44, mounted as shown on a frame 45. From each of these supply rolls 44 we may pass or thread a strip or ribbon 46 over a direction roll 47, said ribbons being in superposed contact, going over said direction roll 47, and through the instrumentality of a feed roll 48, the strip or strips are drawn through a pair of vertically aligned rotary cutting or embossing dies 49, interposed as shown between squeezing rollers 50 if desired, to maintain the proper tautness on the ribbons when passing through said dies and yieldingly contacting with the said strips 46, directly over the feed roller 48, is another roller 49*a* to impart a feeding thrust on the strip or strips in the feeding operation and in line with the shaft of feed roll 48.

A shear plate 51 is affixed to the upper face of a vertical post portion 52, of the frame 45, which supports the paper strip feeding and supporting rolls as shown.

The main feed sprocket 42 is fast on a cutter shaft 53, journalled at the top of opposite posts 45^1, of the frame 45 and fixed to said shaft 53, is a suitable cutter bar 54, having at its ends counterweights 55, (one only shown) see Fig. 1, to better balance the revoluble cutter bar 54 which extends along an adjustable shear plate 51, for a considerable distance, for cutting strips to various determined lengths and of various determined widths.

As above stated, the elevator table at determined intervals, is raised to carry upward and add to the bottom of the stack resting on the support bars 22, 22, the sheet or bunch of sheets last delivered on said table. I accomplish this by pivoting a link 56, to the tripper arm 37 on the rock hub 38, said link having a unitary loop 57 guided between rolls 58 and having a fixed shoulder 59; and passing through said loop 57 is a power shaft 60, formed with trip lug 61.

The shaft 60 may be driven by a chain 62 engaging a sprocket 63 on shaft 60, at a proper speed to cause the tripper to operate at the proper moment for drawing the link 56 to the right for tilting the arm 37 backward and for raising the arm 35 to elevate the table 32 and its contents.

These parts being best shown in Fig. 1 and the elevation of table 32 best shown in Figs. 4 and 5.

The chain 62, may engage a sprocket indicated at 63, on the remote end of the cutter shaft 53, and all of the gears at the rear end of the machine may be timed and interconnected so that the cutting means is properly timed with the tripping means so that the raising of the elevator table may also be properly timed to take up the one or more delivered sheets resting on the table which may be added to the pack and counted at the proper moment.

We employ stacker plates 64 adjustably secured at 65 to the side angle bars or pieces 11, for keeping the progressive stacks aligned vertically, as indicated in Fig. 3 of the drawings.

A stop 75, is provided to line up the forward ends of the strips 24.

Since the said elevator table 32 and its shank 31*a* and roller 29, form a unit free of all positive connection with other parts of the stacker, said unit may be termed a floating or drifting accumulator, and may be so designated or identified in the claims.

In Figures 3, 4, and 5 of the drawings, the sheets 24, to be stacked, are shown wider than the table 32, with their edges resting on the belts 21 which feed the sheets to and over said table by friction, to the fixed stop 75 and this frictional contact is continued as the belts keep moving to hold a sheet against the stop, prior to a lift of the table, to assure perfect alignment of the stacked sheets in the rest bars 22.

What we claim is:—

1. A sheet stacker having in combination rests for a vertically formed free stack of sheets; a table, a fixed stop near the front end of said table; means for frictionally and progressively feeding single sheets to and over said table and against said stop and for momentarily holding said sheets against said stop; lifting means operable for raising the table and a sheet thereon to augment a stack on said rests; and devices for tripping the lifting means for allowing the table a self restoring movement to its normal position.

2. A machine for forming sheet stacks, embodying a support for the stacks; a liftable table including a shank and a roller thereon; an arm having its free end normally underlying said roller; a second arm; a dog and ratchet operable by movements of the second arm; and a powered tripper mechanism including coacting shoulders having interrupted contacts for transmitting action to said arms for effecting contact with said roller and raising said table and for operating said pawl and ratchet, whereby a sheet counter is operated.

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