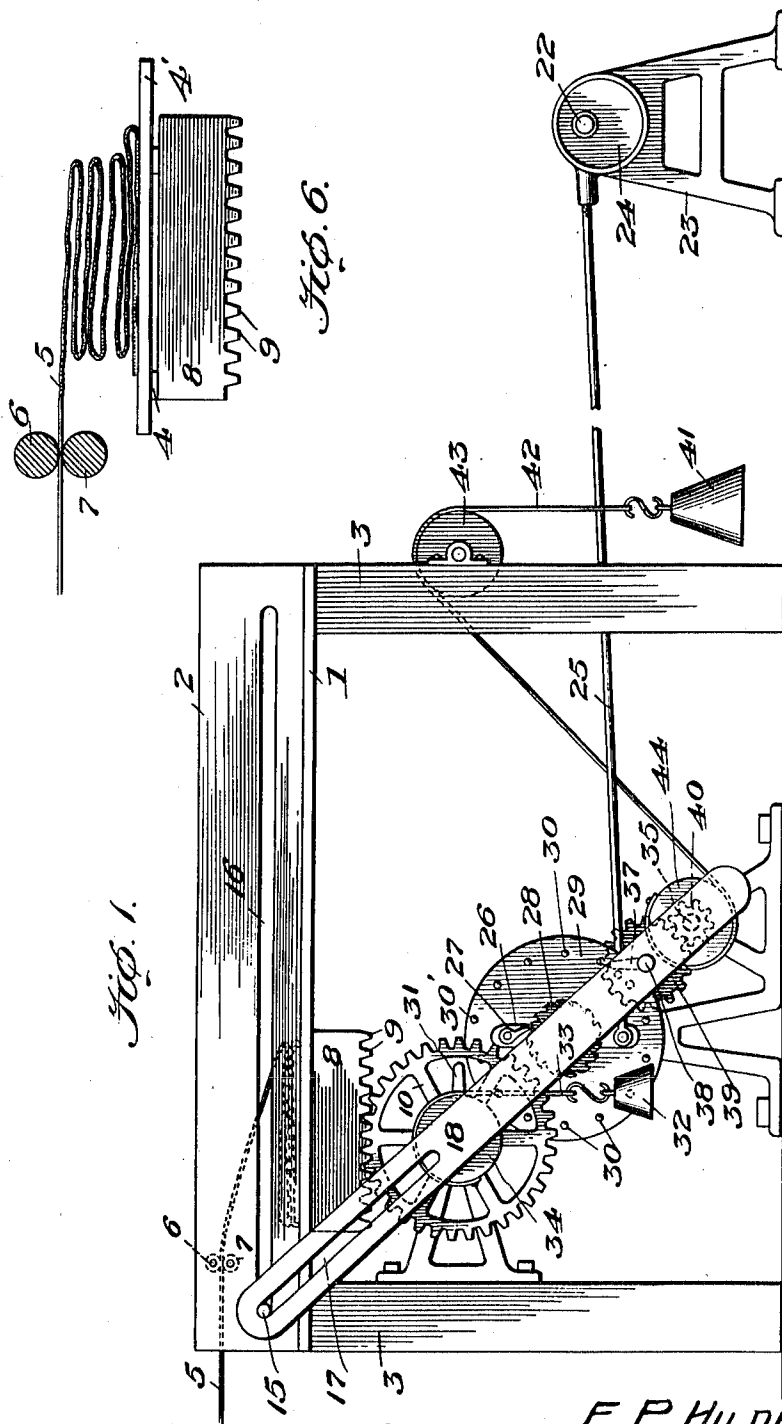


1,090,304.

F. P. HILDEBRANDT.
PAPER FOLDING MACHINE.
APPLICATION FILED MAY 20, 1913.

Patented Mar. 17, 1914.

3 SHEETS-SHEET 1.



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3 SHEETS-SHEET 2.

Fig. 2.

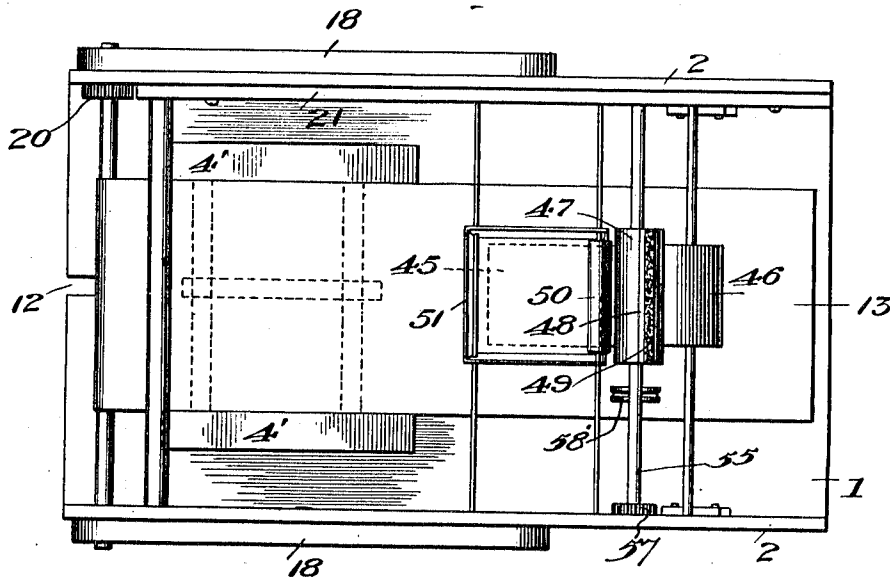
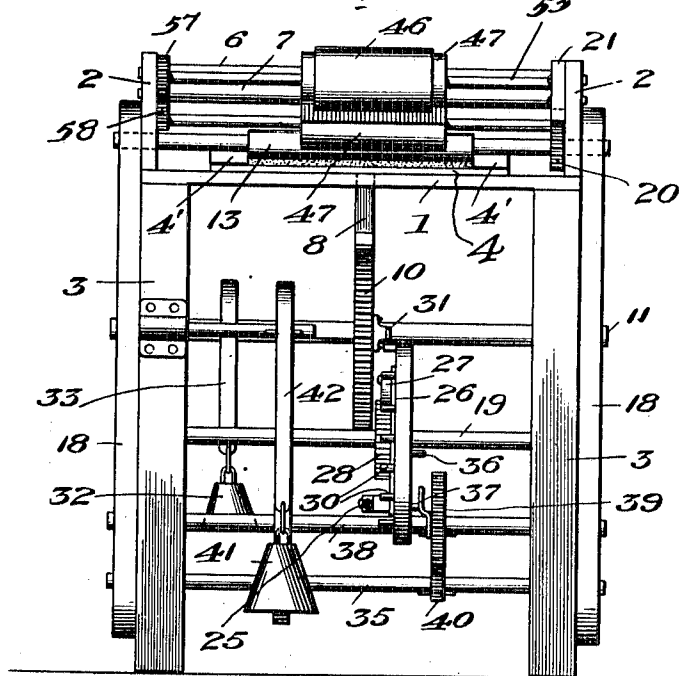


Fig. 3.



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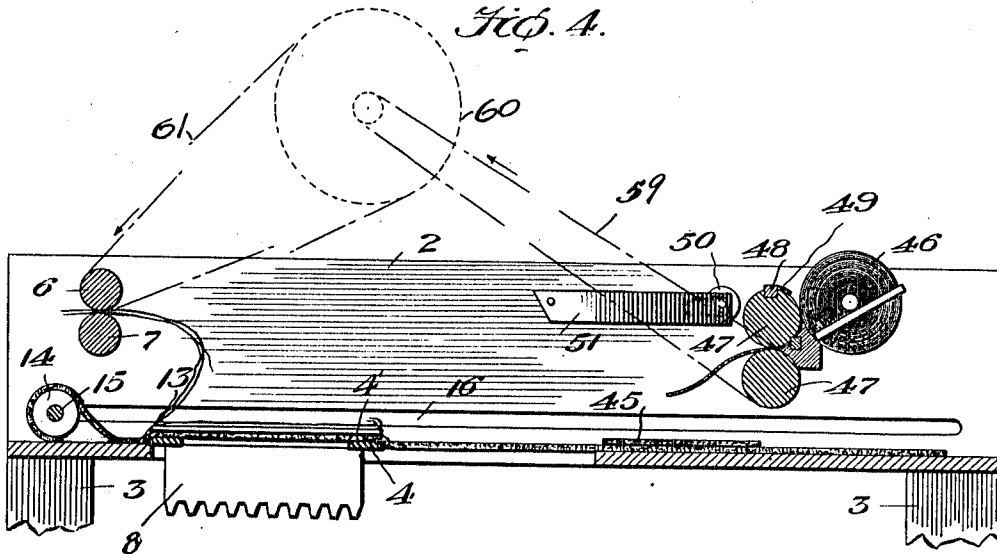
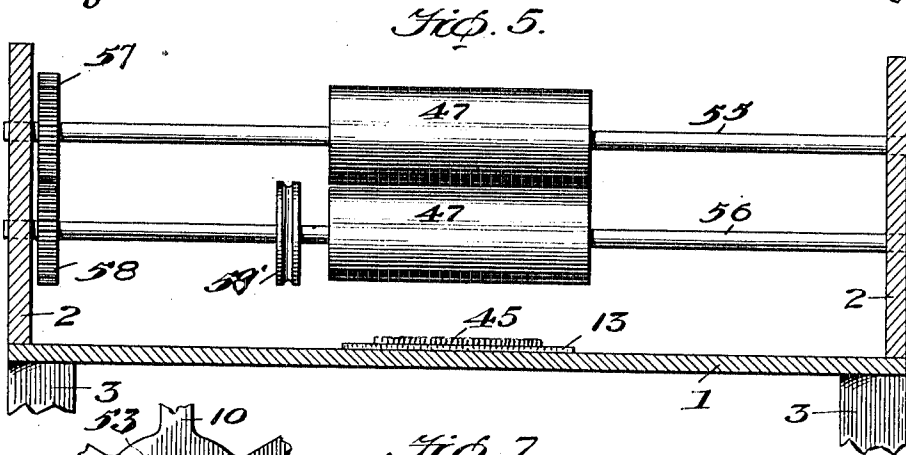
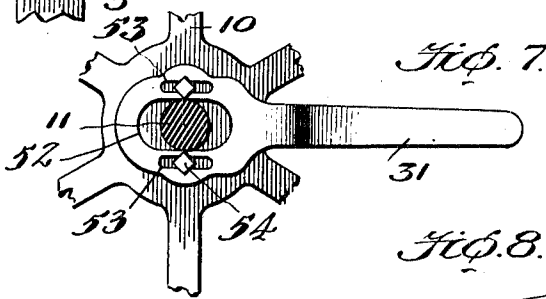
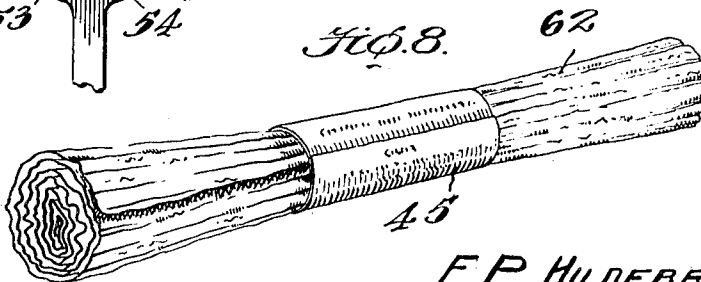
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK P. HILDEBRANDT, OF SAUGERTIES, NEW YORK.

PAPER-FOLDING MACHINE.

1,090,304.

Specification of Letters Patent. Patented Mar. 17, 1914.

Application filed May 20, 1913. Serial No. 768,826.

To all whom it may concern:

Be it known that I, FRANK P. HILDEBRANDT, a citizen of the United States, residing at Saugerties, in the county of Ulster and State of New York, have invented certain new and useful Improvements in Paper-Folding Machines, of which the following is a specification.

The present invention relates to improvements in paper folding machines, and is designed especially for use in connection with crêpe-paper for folding, wrapping and labeling strips of this material.

While I shall hereinafter refer to the machine and describe its use in connection with crêpe paper, it will of course be understood that other material and uses may be employed when applicable to this type of machine.

The primary object of the invention is the provision of a machine that will facilitate the operation of folding, wrapping and labeling a strip of paper into a packet, to eliminate the cost of hand operating, reduce the expenditure of time, and more accurately prepare the packet for market.

The invention consists essentially in a machine embodying three co-acting devices, *i. e.*, a reciprocating device for folding a strip of paper in layers, a device for rolling the folded strip of paper actuated through oscillatable members and wrapping a label about the rolled paper, and a rotary label feeding device. These devices are actuated with predetermined relation to each other so that after the first step of folding the paper strip is completed, the rolling action immediately takes place, and at the completion of this rolling movement the packet is wrapped in its label. In this manner a strip of crêpe paper is fed to the machine and automatically folded, rolled into a packet, wrapped, and labeled and emerges from the machine in marketable form.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles of the invention.

Figure 1 is a side elevation of a machine embodying the novel features of my invention. Fig. 2 is a plan view of Fig. 1 with the driving mechanism omitted for convenience of illustration. Fig. 3 is a rear end view of the machine, being the end from

which the wrapped packet emerges. Fig. 4 is an enlarged longitudinal, vertical sectional view of the machine with carriers 4 omitted. Fig. 5 is a transverse vertical section of the machine. Fig. 6 is a view showing in detail the manner of folding the strip in layers on the reciprocating table. Fig. 7 shows an adjustable tappet. Fig. 8 shows a folded, wrapped and labeled packet of crêpe paper, as it leaves the machine ready for the market.

At the present time, so far as I am aware, the crêpe paper is generally folded and wrapped by hand, in the mills. My machine is to be attached at the rear end of a crêping machine in which the paper is crêped, and after the paper is crêped it is cut into suitable lengths, say 10 feet, and these strips of this length, or of other desirable length, are ready to be fed to my improved machine for folding, wrapping and labeling.

In the preferred embodiment of my invention I employ a table 1 having the side walls 2, 2, and open at the ends, which table is supported upon the legs 3, 3, the whole preferably being constructed of metal. Supported to reciprocate horizontally of this table 1 is a carrier 4 upon which the strip 5 is folded in layers as it is fed from the two feed rollers 6 and 7. At its underside the carrier is provided with a rack bar 8 having teeth 9 that mesh with the teeth of a rack wheel 10 journaled on the shaft 11. The rack bar 8 is adapted to reciprocate in a slot 12 provided for the purpose in the table, and is actuated from the rack wheel 10 as will be described.

The rolling device which rolls the folded crêpe paper into a packet includes an apron or belt 13 of fabric or other similar flexible material one end of which is fastened to the table and the other end of this apron is attached to a roller 14 on the shaft 15. The shaft 15 extends transversely across the table and extends or projects through a longitudinal slot 16 in the side walls 2 of the table and through and beyond slots 17 in a pair of oscillatable side arms 18 which are pivotally supported upon the shaft 35. These side arms oscillate on the shaft 35 and in this manner provide an oscillatable device to cause the shaft 15 to travel longitudinally over the face of the table, guided in the slots 16 and 17. The shaft 15 is rotated through the medium of a pinion 20 or rack

wheel fixed thereon and adapted to engage the teeth of a fixed rack bar 21, attached at one side of the table to its wall 2. By means of the engagement of the rack wheel 20 with its fixed rack bar 21 the apron 13 is wound or wrapped about the roller 14 as its shaft is caused to travel in the slots of the sides of the table and the altitude of the roller 14 above the folded layers of paper causes the apron to roll over the layers, starting by lifting the left edge or end in Fig. 4, and the continued movement of the apron causes the layers to be tumbled and rolled to the right end of the table to be handled by an attendant, and the folded layers of crêpe paper are rolled into a packet.

In Fig. 2 it will be seen that the apron lies between the two side bars 4', 4' of the carrier and that these bars are connected by transverse bars 4 (dotted lines). This construction permits the crêpe paper to be laid in folds between the side bars 4' with the edges of the paper resting thereon, and in position to be gathered up by the apron as it is wound upon the roller 14 as described.

The wheel 10 which causes the reciprocation of the carrier is actuated from a crank shaft 22 supported in the frame 23 and having an eccentric 24. The eccentric 24 is connected by rod 25 to the link 26 pivoted on the shaft 19 and carrying at its free end a pawl 27 in engagement with the rack wheel 28 on the shaft 19. The rack wheel 28 is integral with or fixed to a disk 29 on the shaft 19, and as the connecting rod 25 is reciprocated by the eccentric 24 the link 26 is rocked on its shaft 19 to revolve the disk 29 through the pawl and rack connection 27, 28. The disk 29 is located adjacent the wheel 10 and has a series of pins or studs 30, fourteen in number as illustrated, located at regular intervals about the edge of the periphery of the disk, but it will be noted that the stud 30' is nearer to the edge of the disk than the remainder of the series, for a purpose to be described. A tappet 31 is fixed on the shaft 11 in the path of movement of the studs or pins 30 on the disk 29, and a weight 32 is supported by its belt 33 over a drum 34 on the shaft 11. By these two devices, the series of studs contacting with the tappet and the weight 32 the shaft 11 with its wheel 10 is revolved alternately anti-clockwise and clockwise, and the movement of the wheel causes the carrier to reciprocate horizontally as will be understood.

The side arms 18 are oscillated on their pivots 35 once to each revolution of the disk 29, and this oscillation takes place at the end of the revolution, the folding device being out of operation when the rolling device is operating. At the opposite side of the disk 29 from the series of studs 30 a single stud 36 is located and this stud is adapted to contact with a tappet 37 on the shaft 38

supported between the two arms 18. This shaft 38 has a pinion 39 which engages a pinion 40 on the shaft 35, and as the stud 36 strikes the tappet 37 the shaft 35 is rocked through the two pinions, and the rocking of the shaft swings or oscillates the two arms 18 and the parts carried thereby. The arms 18 are returned to position through the medium of a counterweight 41 which has a belt 42 passing over pulley 43 supported in brackets on the machine and attached to a drum 44 on shaft 35.

The labels 45 are fed from a roll or reel 46 suspended transversely over the table of the machine by the feed rollers 47. One of the feed rollers carries a knife 48 and pasting felt strip 49, the latter adapted to receive paste from a roller 50 in a reservoir 51.

In Fig. 7 an enlarged detail of the tappet 31 is illustrated to show the means of adjusting it with relation to the shaft 11 and the pins 30. For this purpose the tappet is provided with a large slot 52 and a pair of smaller slots 53, in which the set bolts 54 are located and by which the tappet is clamped in adjusted position to the wheel 10.

In Fig. 5 the two supporting shafts 55 and 56 for the label feed rolls 47 are shown with gears 57 58 and a driving pulley 58', which may be driven by belt 59 (dotted lines Fig. 4) pulley 60 and belt 61 from the shaft of the paper feed roll 6.

The completed packet is illustrated in Fig. 8 and designated by the number 62, the label 45 being neatly and tightly fastened thereabout.

The *modus operandi* of the machine is as follows: The machine is driven by power from the shaft 22 as described and the gear wheel 10 is rotated by the action of the pins 30 striking the tappet 31 to rotate the shaft 11. It will be noted that the pin 30' is spaced a greater distance from the pins 30 than they are spaced from each other. This particular arrangement provides for a first layer or fold of greater length than the succeeding layers or folds of the strip 5, and the longer layer or fold which is at the bottom provides a wrapper for the packet, about which the label is to be pasted. The rotation of the wheel 10 causes the carrier 4 to move in one direction, and the weight 32 causes the carrier to move in the reverse direction each time the tappet 31 is freed from a pin or stud 30. In this manner the carrier is caused to reciprocate causing the strip of paper 5 as it is fed, to fall in layers or folds on the carrier. The pin 36 on the side of the disk opposite the studs or pins 30, is arranged to contact with the tappet 37 once to every revolution of the disk. This action on the tappet 37 rocks the shaft 38 and through gears 39 and 40 the oscillatable arms 18 are swung on their pivots 35. This oscillation of the arms

causes the apron 13 to roll upon the roller 14 and the folded paper is rolled over as the apron rolls on the roller 14, until the rolled paper is carried over a waiting label 45, which has been fed from the roll 46 and has paste thereon ready to be sealed. As the roll of crêpe paper is rolled over the label and the label then rolled with the crêpe paper, the label which has been gummed as previously stated is wrapped securely about the packet by hand, as shown in Fig. 8.

Having thus full described the invention, what is claimed herein is:—

15 1. A machine as described including a feeding device, a reciprocating device, an oscillatable device having operative means co-acting with said reciprocating device to receive the paper in folds, and adapted to roll said folded paper at predetermined intervals.

2. The combination with a device for feeding a strip of paper, of a reciprocating carrier, and an oscillatable device having operative means suspended within said carrier for rolling the folded paper from the carrier.

3. A machine as described including a feeding device for a strip of paper, a reciprocating carrier formed with a depression in its upper face and adapted to receive said paper in folds, and an apron located in said depression adapted to roll the folded paper from said carrier.

4. The combination with a device for feeding a strip of paper, of a carrier having a depression in its upper surface and adapted to receive the paper in folds, an apron suspended in said depression, a roller, and means for bodily moving the roller to wind the apron thereon to roll the folded paper.

5. The combination with a device for feeding a strip of paper, of a carrier having a depression in its upper surface and adapted to receive the paper in folds, an apron suspended in said depression, a roller,

and a pair of oscillatable arms for bodily moving the roller to wind the apron thereon to roll the folded paper.

6. The combination with a device for feeding a strip of paper and a carrier for folding the paper in layers, of a roller, an apron secured to said roller and co-acting with the carrier, a pair of oscillatable arms to bodily move the roller, a shaft for the roller and a gear thereon, and a rack bar in mesh with the gear wheel to revolve the shaft and roller.

7. The combination of a reciprocating carrier having a rack bar, a rack wheel engaging therewith and a co-acting tappet, a rotary member having an annular series of spaced pins in the path of movement of the tappet for rotating the rack wheel in one direction, and means for returning the wheel to initial position.

8. The combination of a reciprocating carrier having a rack bar, a rack wheel engaging therewith and a co-acting tappet, a rotary member having an annular series of spaced pins in the path of movement of said tappet, and the space between two adjoining pins being greater than between the others to provide a longer reciprocation of the carrier in one direction, and means for returning the wheel to initial position.

9. The combination of a reciprocating carrier having a rack bar, a rack wheel engaging therewith and a co-acting tappet, a rotary member having an annular series of spaced pins co-acting with the tappet to move the wheel in one direction, and a disk co-acting with the wheel, a belt over the disk, and a weight on the belt for returning the wheel to initial position.

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

FRANK P. HILDEBRANDT.

Witnesses:

GEO. W. CAMRIGHT,
WILLIAM MACMULLEN.