

April 13, 1926.

1,580,342

E. G. STAUDE

MACHINE FOR STACKING PAPER CARTONS

Filed Nov. 26, 1921

3 Sheets-Sheet 1

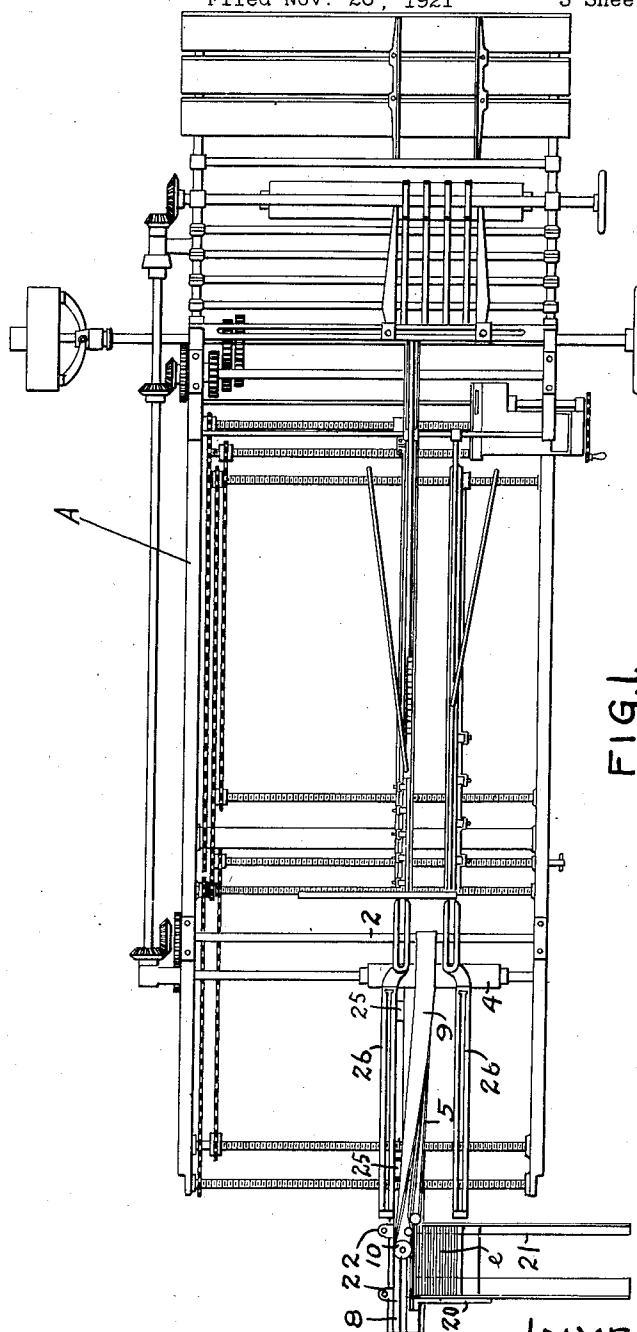


FIG. 1.

INVENTOR
EDWIN G. STAUDE
BY *Paul H. Paul*
HIS ATTORNEYS.

April 13, 1926.

1,580,342

E. G. STAUDE

MACHINE FOR STACKING PAPER CARTONS

Filed Nov. 26, 1921

3 Sheets-Sheet 2

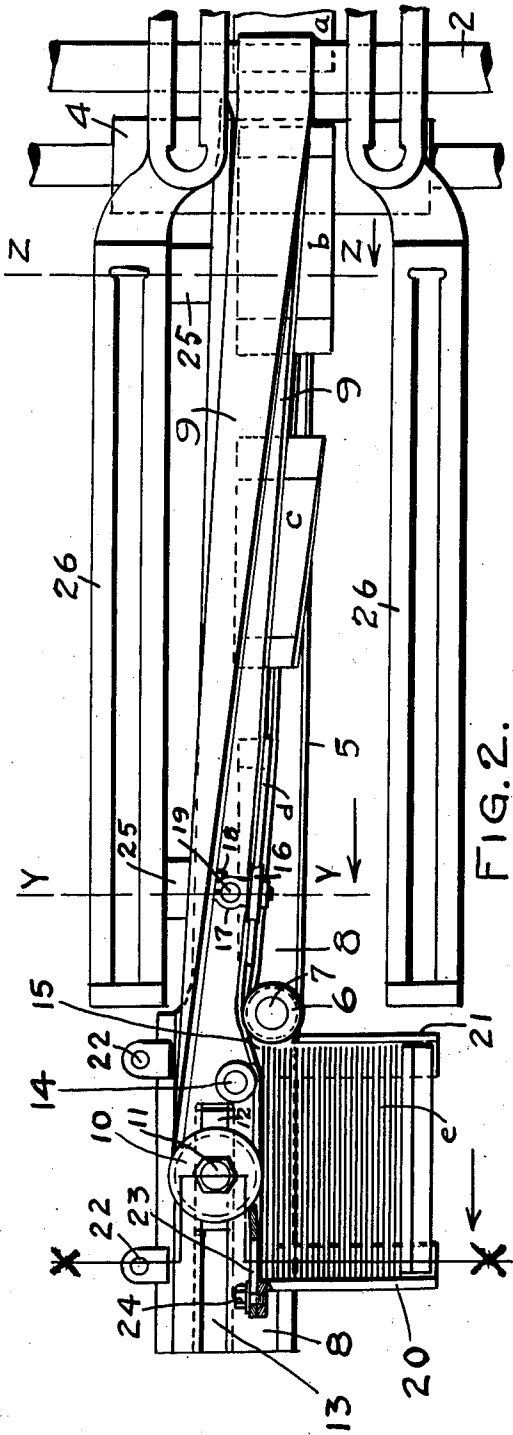


FIG. 2.

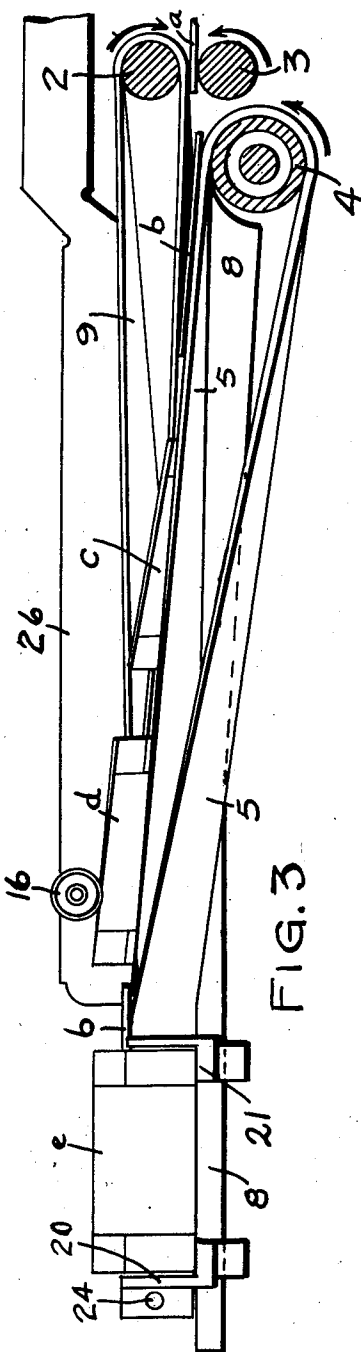


FIG. 3.

INVENTOR
EDWIN G. STAUDE
BY *Paul Paul*
HIS ATTORNEYS

April 13, 1926.

1,580,342

E. G. STAUDE

MACHINE FOR STACKING PAPER CARTONS

Filed Nov. 26, 1921

3 Sheets-Sheet 3

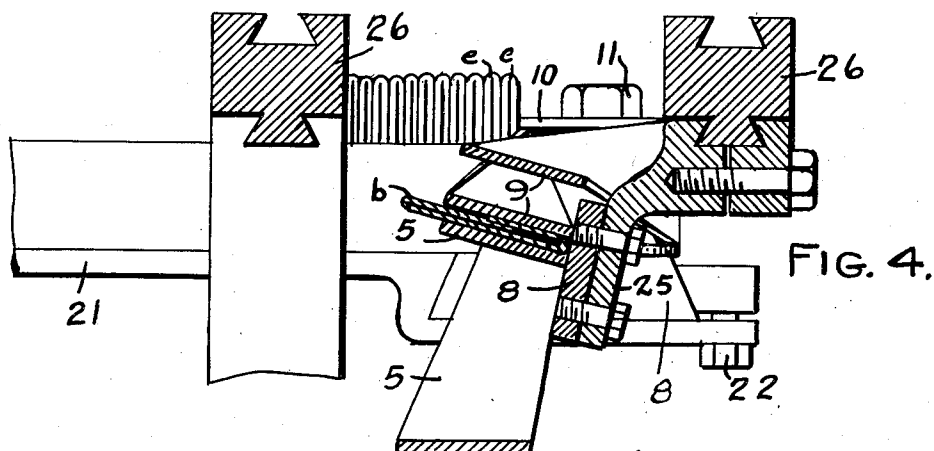


FIG. 4.

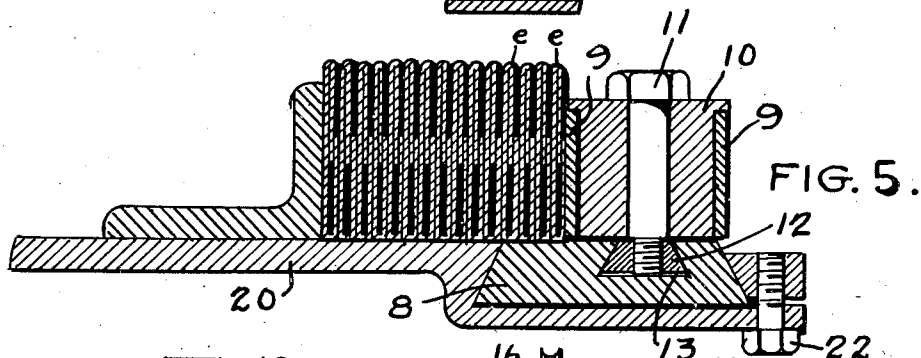


FIG. 5.

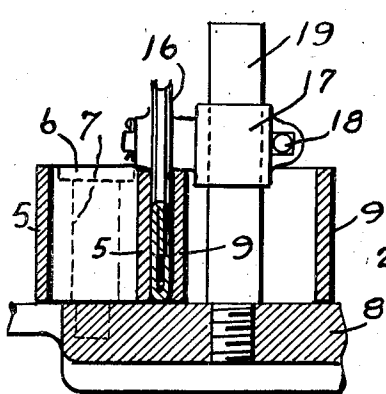


FIG. 7.

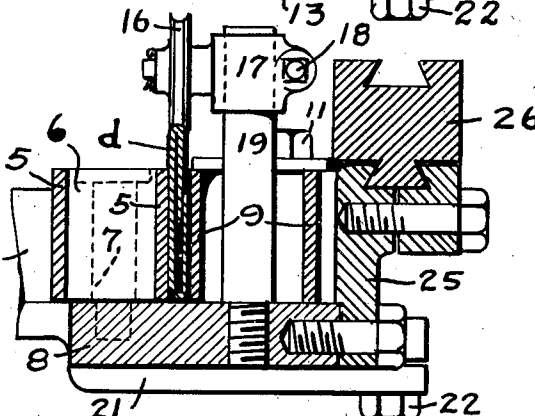


FIG. 6.

INVENTOR
EDWIN G. STAUDE
BY *Paul & Paul*
HIS ATTORNEYS.

Patented Apr. 13, 1926.

1,580,342

UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

MACHINE FOR STACKING PAPER CARTONS.

Application filed November 26, 1921. Serial No. 518,043.

To all whom it may concern:

Be it known that I, EDWIN G. STAUDE, a citizen of the United States, resident of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Machines for Stacking Paper Cartons, of which the following is a specification.

This invention relates particularly to improvements in the delivery end of a machine, similar to that described in my Patent No. 1,104,013, dated July 21, 1914, and particularly to a new and simple device for receiving the cartons one at a time in a horizontal line and automatically moving each carton back of the carton ahead, thus delivering the cartons in a so-called stack.

Several methods for performing this operation of stacking are covered in my Patent No. 1,018,087, dated February 20, 1912, and Patent No. 961,263, dated June 14, 1910.

The range of work and required service of a machine are continually increasing, making it necessary to adapt it for classes of work which hitherto have not been handled with entire success.

I have found that where cartons are stacked in a vertical pile that it is necessary to wait a sufficient length of time for the ink to dry on the printed surface before the carton can be run through the machine, the weight of the pile bearing against the stacker belts, causing the surface of the blank to become smeared.

The object of this invention is to collect the articles in substantially the same manner, but deliver them in a horizontal direction, so that their weight when collected will not rest on the stacker belts, but on suitable stationary guides.

A further object is to provide a mechanism for stacking paper cartons which will be quickly adjustable within a considerable range, particularly from the very small cartons to the medium sized cartons.

A further object is to provide a mechanism which will receive the cartons and deliver them in the proper position without excessive pressure at any point during the operation.

A further object is to provide a means for holding the cartons in a horizontal line at the delivery end of the device, so that the delivered stack will present an even and uniform appearance, and the carton manip-

ulated by the counter (not shown) will be quickly recognized.

The invention consists generally in an improved means for receiving the folded carton or blank from the feed belts and stacking them in a pile, one back of the other, in a horizontal direction at right angles to the original direction of travel.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a plan view of the machine to which my improved stacking mechanism has been applied,

Figure 2 is a plan view on an enlarged scale of the delivery end of the machine,

Figure 3 is a longitudinal section showing the stacked cartons in side elevation,

Figure 4 is a sectional view of Fig. 2 on the line $z-z$, looking in the direction of the arrow,

Figure 5 is a section of Fig. 2 on the line $x-x$, looking in the direction of the arrow,

Figure 6 is a section on the line $y-y$ of Fig. 2, looking in the direction of the arrow,

Figure 7 is a view similar to Figure 6, showing the mechanism for causing uniform delivery, adjusted for a narrow blank.

As shown in the drawing, A represents the machine to which my invention is applied, and 2 and 3 represent respectively upper and lower creasing rolls. 4 represents the usual stacker belt drum. Around this drum I provide an endless belt 5, which passes around a small pulley 6, pivoted on a vertical axis at right angles to the horizontal axis of the stacker belt drum 4, thus causing the belt to have a quarter twist.

The pivot for the small pulley 6 is preferably secured by a threaded stud 7, screwed into a horizontal bar 8.

On the upper creasing roller 2 I provide a similar endless belt 9, passing around an adjustable pulley 10, pivoted on the stud 11, which is tapped into the beveled shoe 12, and secured rigidly by the threaded end of the stud bearing against the bottom of the beveled groove 13. This construction permits the pulley 10 to be adjusted to vary the distance of contact of the belt 9 against the stacked cartons, as hereinafter described.

An idler pulley 14 is provided to guide the belt, so that the period during which the belt 9 is in contact with the stacked cartons will be increased, and further to cause additional contact of the belt 9 with the belt 5 at the point where said belt passes over the roller 6.

The construction just described will cause the belt 9 to have only partial contact with the back of the carton and will leave the cartons extended at the forward edge at the point 15 in order that the succeeding carton may slide in the rear of the one ahead.

The roller 14 is not shown adjustable, but in practice I provide a construction similar to that shown for securing the roller 10, to vary the distance between the roller 10 and the roller 14.

As these belts have a quarter twist, it follows that if folded cartons or blanks are fed between them, they must, during the course of their travel, change from a horizontal to a vertical position.

In the drawing shown in Figures 2 and 3, I have indicated cartons *a*, *b*, *c*, *d* and *e*, in the successive positions that each carton assumes in its travel into the stacker.

The cartons do not always strike the creasing rollers at the same point. That is, their position will vary as much as one fourth of an inch laterally and if this condition is not corrected as they are given a quarter twist, they will not lie evenly in the stacker.

To insure feeding into the stacker in a uniform plane, I provide a small roller 16, to ride on the edge of the carton, as shown in Figure 3. This roller is pivoted on a sliding member 17, clamped by a cap screw 18 on a post 19 that is screwed into the bar 8.

In Figure 6, I have shown the roller 16 on the edge of the carton *d*, showing that the carton, before it can pass the pulley 16, must travel against the bar 8. The pulley 16 is of sufficient diameter so that on narrow cartons it will pass in between the belts 5 and 9, as shown in Figure 7, and at all times the carton can be controlled before it is delivered into the stacker. Suitable guides 20 and 21 are clamped on the bar 8 by the cap screw 22, as shown in Figure 5. From the construction shown, it can be easily seen that by sliding these guides along the beveled surface of the bar 8, the distance between the guide 20 and the guide 21 can be varied. On longer boxes, where it is necessary that the guide 20 be adjusted some distance away from the pulley 10, I provide a plate 23, secured to the bar 20 by a cap screw 24, as shown in Figure 2.

The hole in the plate 23, through which the cap screw 24 passes, is slotted to vary the distance that the plate may extend into

the stacker to adapt the guides for cartons of different length.

The bar 8 is also given a quarter twist, so that each of the belts will rest at all times against the bar and assist in guiding the belt as well as the cartons passing through the twisted portion of the belts.

Tension rollers may be provided to hold the belts in contact with the carton, although I find that the action of the twist is such that it carries the belts forward without the use of these rollers.

The bar 8 is supported by suitable brackets 25 that are clamped to the lower reach of the ordinary stacker frame 26 on the machine.

From the construction just described, it is evident that I may clamp this special stacker device to the standard machine, as shown in my previous patents, by simply removing the spiral stackers and stacker belts, as described therein. In fact, it is my intention to use both of these devices on the standard machine, but I do not want to limit myself to such use, as I consider this stacker capable of handling the average carton.

While I have shown the receiving stacker delivering the cartons to the left of the machine, I do not limit the invention to this exact construction, for I may successfully deliver the cartons to the right by shortening up the belt 9 and lengthening out the belt 5, and obtain reverse positions for stacking, without changing the direction of twist in the belts. In fact, in practice, the parts are made so that the delivery in either direction is possible by simply altering the length of the endless belts 5 and 9.

I claim as my invention:

1. In a machine of the class described, a stacking receptacle in combination with means arranged to receive folded articles and deliver them to said receptacle on one edge in the direction of movement of said delivering means at an angle to their initial movement in said delivering means.

2. In a stacking machine, means for transporting articles to be stacked comprising oppositely disposed conveying elements co-operating to receive the articles in one plane and during transportation changing the articles to another plane, and a stacking receptacle positioned to one side of the transporting means and having an open side towards said means, said transporting means acting to deliver the articles transported side-wise into said receptacle one against the other in stacked relation.

3. In a machine of the class described, a stacking receptacle in combination with a stacking device arranged to receive the folded articles and deliver them horizontally to said receptacle in the direction of movement of said delivering means at right an-

gles substantially to their initial movement.

4. In a machine of the class described, a stacking receptacle in combination with a feeding means arranged to move across the open end of said receptacle to impart a quarter turn to folded articles before delivery to said receptacle.

5. In a machine of the class described, a stacking receptacle having a side opening leading thereto in combination with means for delivering folded articles on edge to said opening said delivering means extending across the entrance to said receptacle and having means for adjustment with respect to said entrance.

6. In a machine of the class described, a stacking receptacle having a side receiving opening in combination with means for imparting a partial turning movement to the articles fed and deliver them to said receptacle through said opening the articles in said receptacle being parallel substantially with the direction of movement of said delivering means.

7. In a machine of the class described, a stacking receptacle in combination with means for feeding cartons initially in one direction, said means being adapted to impart a partial rotation to said cartons and deliver them to said receptacle at right angles substantially to their initial movement

said delivering means extending across the front of said receptacle for delivering the cartons vertically on edge therein parallel substantially with the direction of movement of said delivering means.

8. In a machine of the class described, a horizontally arranged stacking receptacle, a stacker belt having a quarter twist, a second belt cooperating with said first-named belt to impart a quarter turn to the articles delivered between them, said second belt having an adjustable pulley in front of and adjacent said receptacle, the adjustment of said pulley permitting the distance of contact of said second belt with the stacked articles to be varied.

9. In a machine of the class described, the combination with endless stacker belts adapted to receive and impart a quarter turn to the articles fed between them, a horizontal receptacle arranged to receive the articles on edge one in front of the other from said stacker belts, one stacker belt extending in front of said receptacle parallel substantially with the articles therein, and said receptacle being adapted for adjustment on either side of said stacker belts for right or left hand delivery of the articles thereto.

In witness whereof, I have hereunto set my hand this 15th day of November 1921.

EDWIN G. STAUDE.