April 7, 1925.

1,532,153

T. A. PALMER

MATCH BOX FILLING MACHINE

Filed June 30, 1924

3 Sheets-Sheet 1

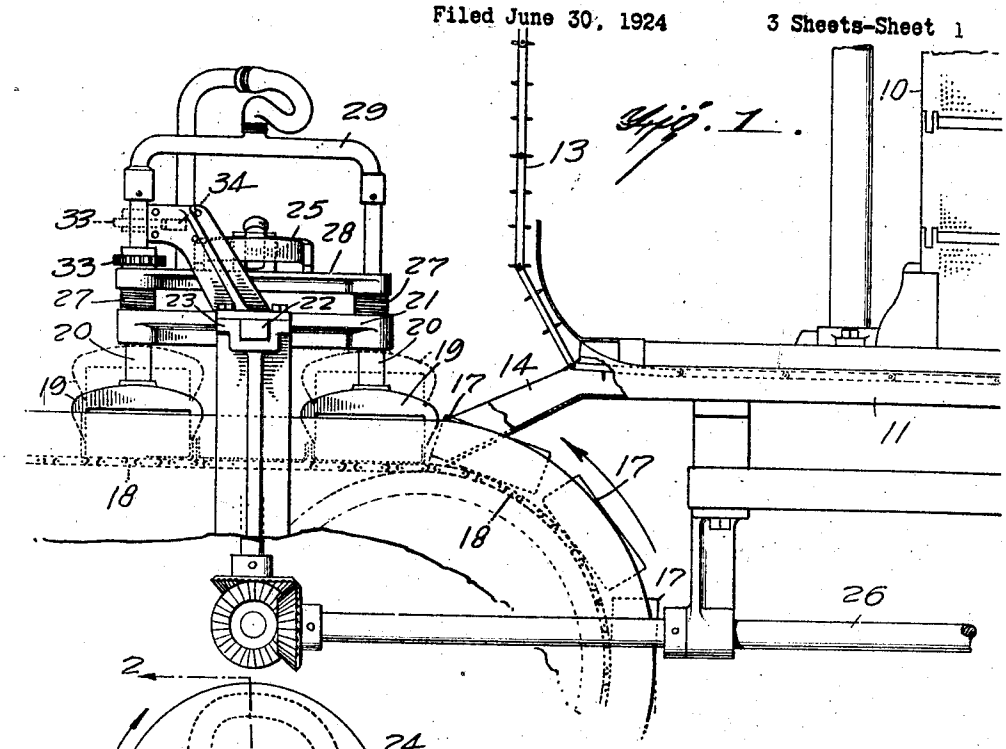


Fig. 1.

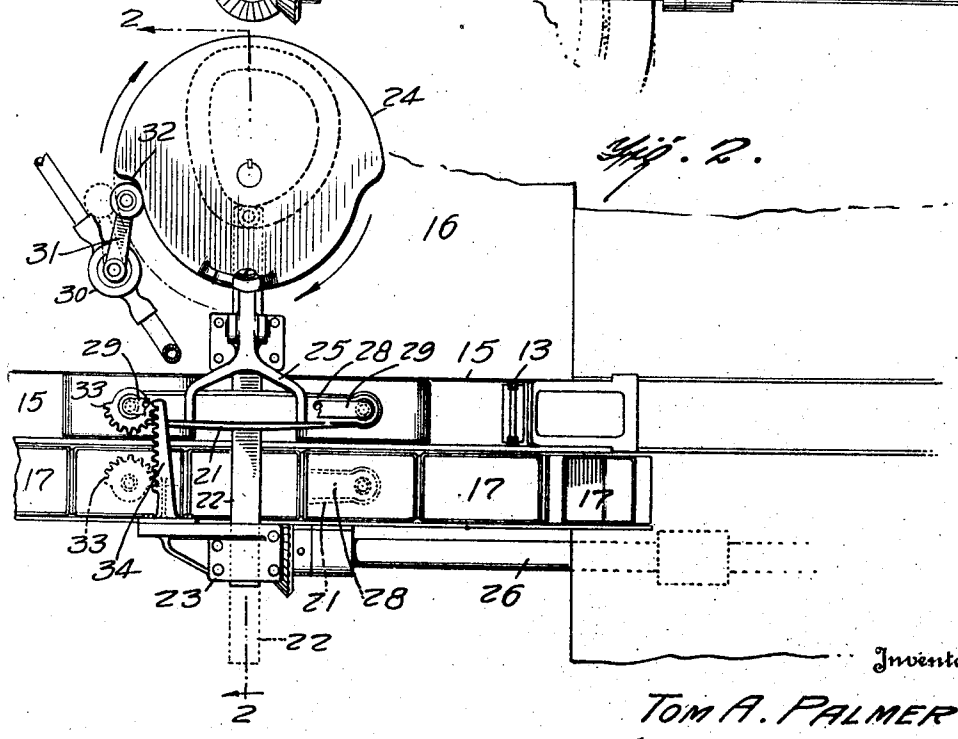


Fig. 2.

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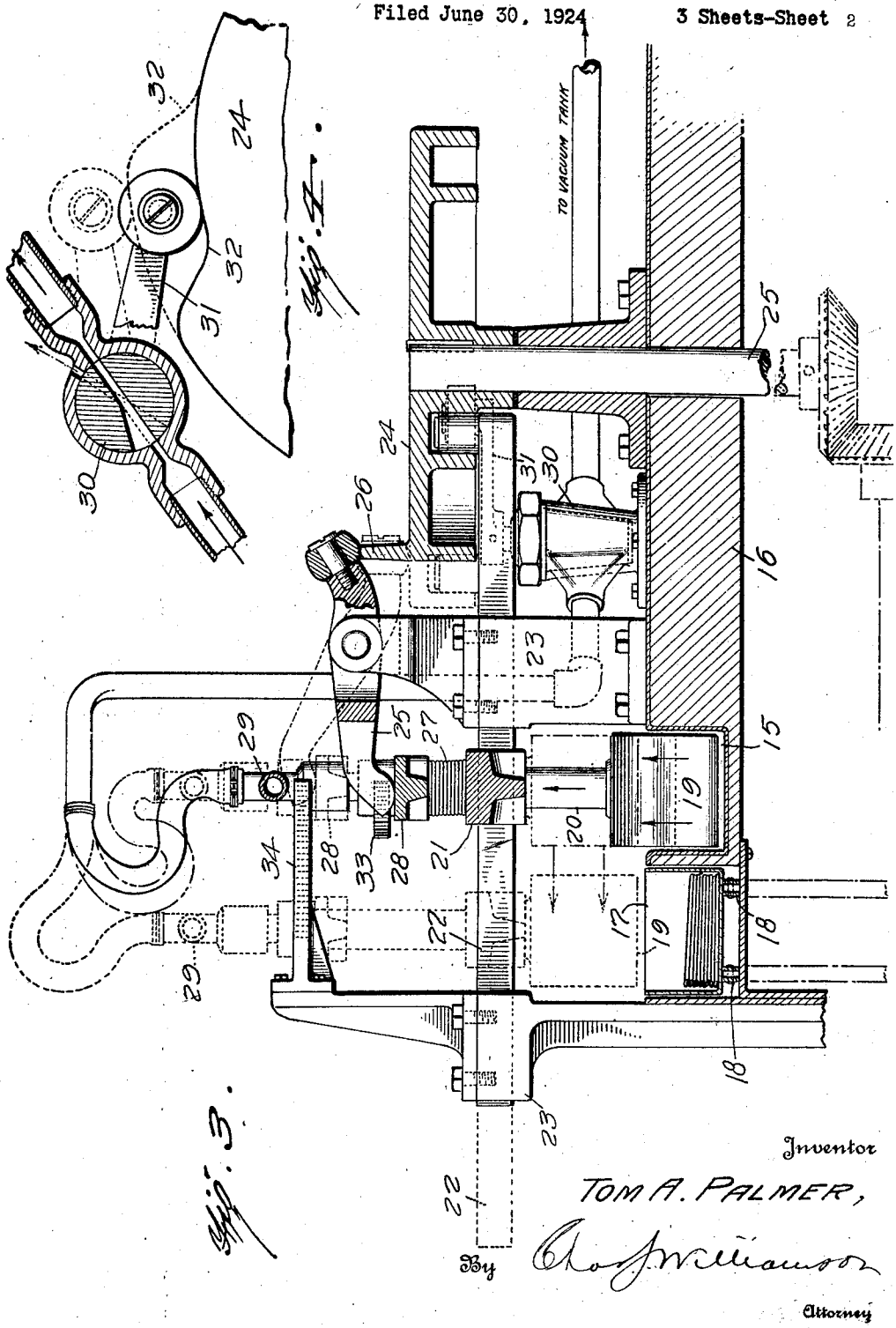


Fig. 1.

Fig. 3.

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Fig. 5.

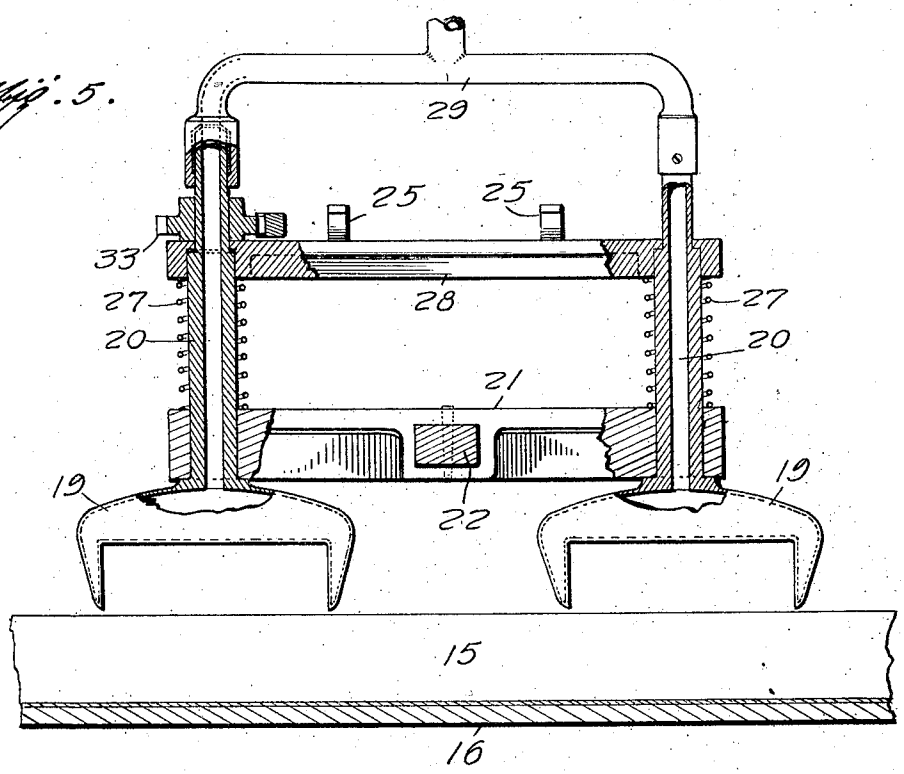


Fig. 6.

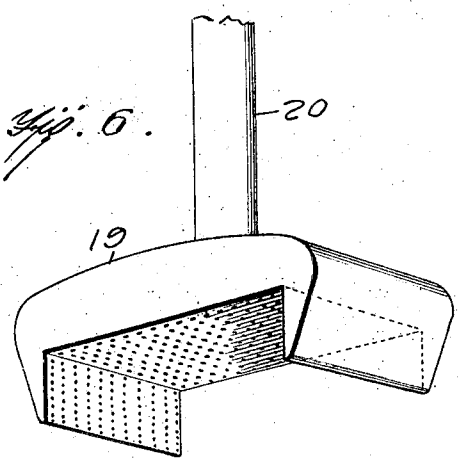
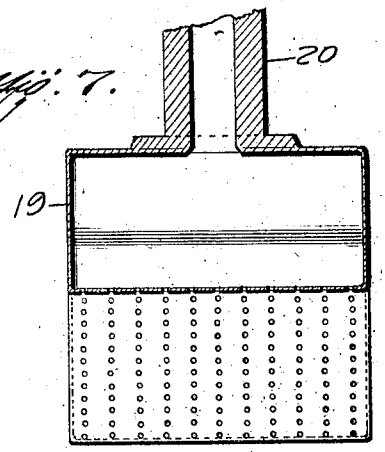


Fig. 7.



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Patented Apr. 7, 1925. 1,532,153

UNITED STATES PATENT OFFICE.

TOM A. PALMER, OF AKRON, OHIO.

MATCH-BOX-FILLING MACHINE.

Application filed June 30, 1924. Serial No. 723,320.

To all whom it may concern:

Be it known that I, TOM A. PALMER, residing at Akron, Ohio, a citizen of the United States, have invented certain new and useful Improvements in Match-Box-Filling Machines, of which the following is a specification.

My invention relates to mechanism for placing matches immediately after being delivered from the match making machine into boxes ready for retail sale and the object of my invention is to provide mechanism for this purpose which will be of extreme simplicity and high efficiency. My invention consists in whatever is described by or is included within the terms or scope of the appended claims.

In the accompanying drawings:

Fig. 1 is an end elevation of enough of a match machine to illustrate an embodiment of my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a detail view in perspective of the transfer head by which the matches are taken from the filler trough and delivered to the match boxes;

Fig. 5 is a detail view partly in section of the pneumatic carrier or head;

Fig. 6 is a perspective view of the suction head;

Fig. 7 is a cross section thereof.

I have embodied my invention in the kind or type of match machine employing an endless chain or carrier, 10, of perforated splint holding plates from which the finished matches are punched a row at a time into a horizontal trough, 11, extending transversely of the machine and through which the matches lying parallel are carried by an endless chain, 13, being delivered by the latter to a downwardly inclined section, 14, of the trough from which the matches pass into a horizontally extending trough, 15, in a table, 16. From the trough, 15, I transfer the matches by a pneumatic device to the customary pasteboard boxes into which they are packed for retail sale, the match boxes being fed along a path parallel with the trough, 15, and which may itself be a trough, 17, the match boxes being so moved by an endless chain or carrier, 18, having at intervals thin projections to engage the rear ends of the match boxes to move them onward through the trough, 17. The pneumatic device includes one or more hollow heads of the construction clearly shown in Figs. 6 and 7 having perforated top and end walls so that when air is drawn or exhausted from the interior of the head the space between the top and ends of the head will be filled with matches and retained by the head during the transport of the matches to the boxes into which they will drop when the suction action from within the head is cut off. When the match boxes are the deep ones which necessitate the laying of the matches in two layers with their heads in opposite directions to secure an even pack of the matches, the suction head has its perforated end walls of a depth substantially half that of the match box, while the distance between the end walls and therefore the length of the perforated top or horizontal portion of the head are substantially the length of the match box while the width of the head is substantially the width of the match box. In such a case as this the matches are delivered in what in effect are two successive layers to the box, and while one layer may be transported and delivered to the box from the trough, 15, without any change of endwise position, the other layer requires to be turned through 180 degrees in the transfer operation to secure the desired opposing relation of the heads of the two layers of matches. Of course, with match boxes of a depth not requiring such relative disposition of the matches the pneumatic head has a capacity for a load at one time sufficient to fill the box or should it take more than one load it will be unnecessary to turn the head to reverse the position of the matches in the box. The pneumatic head when the matches are to be placed in the box in two oppositely arranged layers could be arranged to carry one layer without any change of position, and caused to rotate through 180 degrees in carrying the second layer, or the arrangement shown in the drawings can be used which comprises two pneumatic heads one of which is mounted so as not to rotate while the other is mounted to be rotatable through 180 degrees, such heads being in line parallel with the length of the trough, 15, and being simultaneously loaded with a layer of matches and simultaneously moved to the trough through which the boxes pass and their loads simultaneously discharged, the first box discharging its load into the arriving empty box,

and the second head discharging its load into the half filled box.

Referring in detail to what is shown in the drawings the two pneumatic heads, 19, have each a tubular vertical shank, 20, which passes upwardly through and is vertically slidable in a hole in a cross bar, 21, fixed to a horizontally supporting bar, 22, which is mounted to slide horizontally in guides, 23, so as to move the pneumatic heads to and fro between the match receiving trough, 15, and the box trough, 18, this to and fro movement being produced by a cam, 24, upon a shaft, 25, which by suitable gearing receives motion from the shaft, 26, which is one of the shafts of the match machine. The head shanks, 20, are vertically slidable because it may be desirable to lower the heads into the match trough, 15, to assure the gathering by the head of its load of matches and the downward movement of the heads may be produced by a lever, 25, acted upon by a cam rib, 26, on the top of the cam, 24, while the upward movement may be produced by a coil spring, 27, around each shank and bearing at the lower end upon the cross bar, 21, and at the upper end upon a cross bar, 28. Both of the tubular shanks, 20, at the upper end are connected by piping or tubing, 29, with suction or vacuum apparatus, not shown, by which the air from within the heads, 19, may be withdrawn. In the piping is a rotary valve, 30, which by a lever, 31, acted upon by a cam, 32, on the periphery of the cam, 24, to open and close communication between the heads and the vacuum apparatus so that when the pneumatic heads, 19, are depressed into the matches in the trough, 15, suction will exist and will be maintained until the heads, 19, are above the match boxes and then the suction cut off. As has been explained one of the pneumatic heads, 19, is non-rotary while the other is rotatable through 180 degrees and such rotation may automatically be produced by a gear segment, 33, fixed to the tubular stem, 20, of that head, and a rack bar, 34, stationarily supported in a horizontal position so that as the head is reciprocated between its loading and unloading positions it will be revolved first through 180 degrees in one direction and then through 180 degrees in the opposite direction.

It will be seen that my invention is applicable to the filling of boxes or receptacles with other splint-form articles besides matches.

What I claim is:

1. The combination of the filler trough of a match machine, a chambered head having walls with perforations leading into the space within the head and means to exhaust air from within the head said head having external to said chamber opposite surfaces to confine matches against sidewise displacement.

2. The combination of the filler trough of a match machine, a chambered head having walls with perforations leading into the space within the head, means to exhaust air from within the head, and means to move said head to and from the filler trough said head having external to said chamber opposite surfaces to confine matches against sidewise displacement.

3. The combination of the filler trough of a match machine, a chambered head having walls with perforations leading into the space within the head, means to exhaust air from within the head, said walls being formed by a horizontal surface and opposite vertical surfaces.

4. The combination with means for holding slender articles in parallel order, a support for boxes or receptacles and a chambered pneumatic head with perforations opening to the exterior of the head movable to and from a position above the box support said head having on its exterior opposite article engaging surfaces to maintain articles in parallel order.

5. The combination with the filler trough of a match machine, means for moving matches in parallel relation through such trough, means for feeding boxes to be filled end to end parallel with and adjacent said trough, a suction head movable to and fro over the trough and the boxes moving adjacent the trough, means to exhaust air from within said head when it is in position over matches in the trough to produce suction, and means to break such suction when the head is over the boxes.

6. The combination with the filler trough of a match machine, means for moving matches in parallel relation through such trough, means for feeding boxes to be filled end to end parallel with and adjacent said trough, a suction head movable to and fro over the trough and the boxes moving adjacent the trough, means to exhaust air from within said head when it is in position over matches in the trough to produce suction, and means to break such suction when the head is over the boxes, the rate of to and fro movement of the head being such in relation to the rate of movement of the boxes that the head will be over the boxes more than once while they are passing the head.

7. The combination of the filler trough of a match machine, means for guiding boxes to be filled and means receiving matches from the trough and movable between the trough and boxes for transferring matches from the trough to the boxes in successive layers, the matches of successive layers being delivered by said transfer means in reverse position as to the heads thereof.

8. The combination of the filler trough of a match machine, means for guiding boxes to be filled and means receiving matches from the trough and movable between the trough and boxes for transferring matches from the trough to the boxes in successive layers, the matches of successive layers being in reverse position as to the heads thereof, said means comprising a rotatable match holding head mounted to rotate on an axis normal to the length of the matches carried thereby.

9. The combination of the filler trough of a match machine, means for guiding boxes to be filled and means receiving matches from the trough and movable between the trough and boxes for transferring matches from the trough to the boxes in successive layers, the matches of the successive layers being in reverse position as to the heads thereof, said means comprising two match holding heads one of which is rotatable and one non-rotatable.

10. The combination of a filler trough of a match machine, a chambered head having a horizontal wall with perforations leading into the space within the head and spaced walls extending downwardly from said perforated wall, means to exhaust air from within the head intermittently and means to move said head vertically and horizontally with reference to said trough, the vertical movement carrying said spaced walls down into and out of the trough.

11. The combination of means for moving slender articles in parallel order in a direction crosswise of their length, a support for boxes or receptacles, and pneumatic means for transporting such articles to said boxes or receptacles comprising a pneumatic head movable to and from a position above said support, said head having on its exterior opposite article engaging surfaces to maintain such articles in parallel order.

In testimony whereof I hereunto affix my signature.

TOM A. PALMER.