June 15, 1926.

1,589,082

C. ALBERS

FEED DEVICE FOR BELT CONVEYERS

Filed April 4, 1924

Fig. 1.

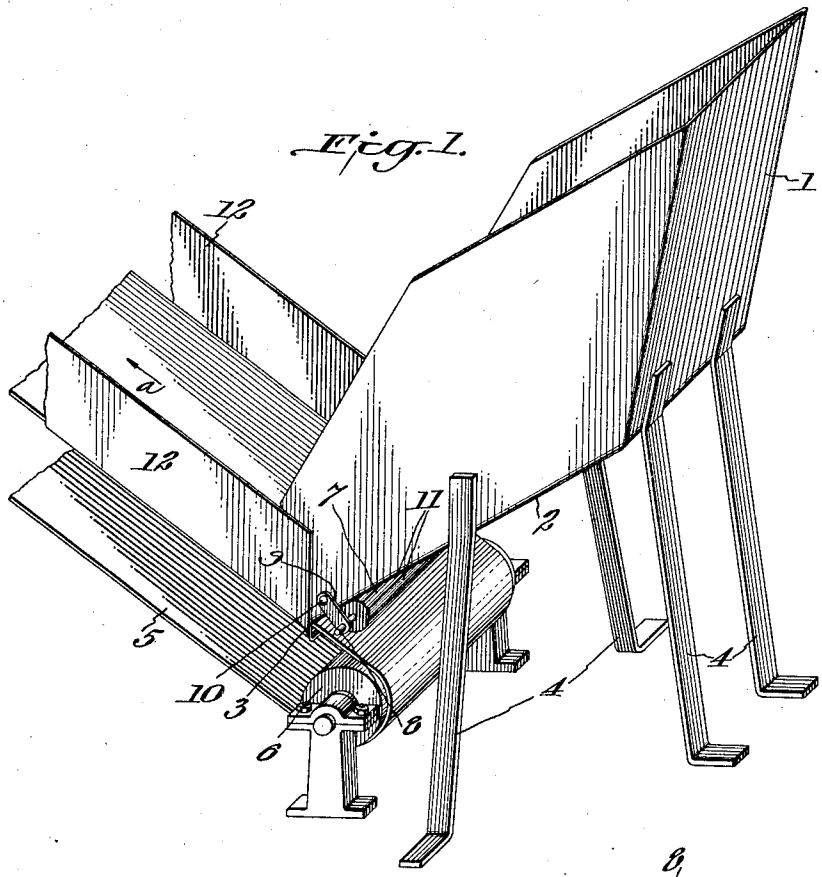
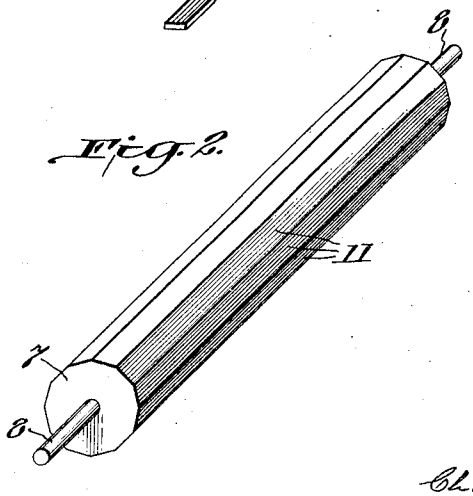


Fig. 2.



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UNITED STATES PATENT OFFICE.

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FEED DEVICE FOR BELT CONVEYERS.

Application filed April 4, 1924. Serial No. 704,252.

In the manufacture of matches, and particularly in the boxing of matches, especially by automatic machinery, a great deal of what is termed "waste" is accumulated, consisting of matches which, although ordinarily perfect in themselves, have dropped out of various chutes and conveyers or have been packed in boxes which have become mutilated in their progress through the box filling or sliding machines and have been taken out and thrown into the waste receptacle by the operators and attendants of the machine. Obviously, this accumulation of matches would, if it were thrown away, amount, in a short time, to a considerable loss, and therefore this waste is saved, cleaned (that is lint, splinters, broken matches, parts of boxes and other extraneous matter removed) and is then packed.

The present invention relates primarily to a device adapted to feed such waste in bulk to a box filling machine, and its main object is to automatically so distribute the matches, when dumped in a mass into the hopper of the feeding device, that they will be substantially evenly distributed over a conveyer belt or the like, to the end that they will fall into the feed trough of the box filling machine in even distribution throughout a substantial portion of its length as determined by the width of the feed belt or the like above referred to, and will not fall into the trough in such numbers at any one point therein as to cause such an accumulation of matches at that point as can not be easily handled by the trough.

To this end the invention consists in a feed device for belt conveyers, comprising a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past the discharge end of a hopper, and a substantially cylindrical body of rotation arranged beneath the bottom of said hopper and cooperating with said conveyer, this body of rotation, due to its arrangement, being capable of receiving rotative movement from the conveyer and of striking against the hopper bottom for the purpose of aiding gravity in the feed of articles deposited in bulk in the hopper, and of distributing such articles so that they will pass from the discharge end of the hopper substantially separately throughout its width and be evenly distributed upon the conveyer, as I will proceed now to explain and finally claim.

In the accompanying drawings illustrating the invention, in the figures of which like parts are similarly designated, Figure 1 is a fragmentary perspective view illustrating an embodiment of my invention. Fig. 2 is a perspective view of the roller.

The device comprises a hopper 1 having a bottom 2 provided with a discharge end 3 and supported upon any suitable supports 4.

Arranged adjacent to and travelling past the discharge end 3 of the hopper in the direction of the arrow *a*, Fig. 1, is a conveyer belt or the like 5, which passes at its hopper adjacent end around a pulley 6 and extends therefrom outwardly to a point in such proximity to the feed trough of a match machine or other point of discharge as to ensure articles carried by it being properly discharged into such trough or at such other point. As will be seen, the pulley 6 is arranged at a slight distance back from the discharge end 3 of the hopper so that the conveyer 5 extends for some distance beneath the bottom of the hopper.

Arranged between the bottom of the hopper and the conveyer 5 and normally resting upon said conveyer is a substantially cylindrical body of rotation or roller 7 provided with spindles 8, journalled in any suitable swivelled bearings, such as links 9, which may be pivoted as at 10 to the sides of the hopper or may be carried by other suitable supporting means. As shown particularly in Fig. 2 this body of rotation or roller 7 may be provided with a plurality of flat faces 11 which render it of polygonal formation, and although such formation is not essential to its efficient operation, does accentuate is movements, as will be hereinafter pointed out.

It will be understood that as the conveyer 5 travels over its pulley 6 it will impart rotative movement to the roller 7 and, as such movement is rapid, the roller will jump up and down upon the conveyer and will during this jumping movement strike against the bottom of the hopper, and thus vibrate the hopper. This vibration of the

hopper by the roller 7 will assist the force of gravity in feeding articles deposited in bulk in the hopper down the bottom thereof. It will moreover tend to separate from the mass of articles, individual articles, and will distribute such individual articles across the bottom of the hopper in substantially uniform even distribution at its discharge end, and will cause the discharge of such articles in similar substantially uniform distribution upon the surface of the conveyer as it travels past the discharge end of the hopper.

In the case of the feed of matches with this device, it will be understood that, when such matches are deposited in bulk in the hopper, they have a tendency to remain for the most part in a mass, and the vibration of the bottom of the hopper, caused by the striking against it of the roller, will cause individual matches to be separated from the mass rather than causing the mass as a whole to slide down the bottom of the hopper.

If desired rotating bodies, adapted to be driven by the conveyer 5 may be placed at the discharge end of the hopper to assist in separating and discharging the articles, and in addition to assist in holding back the mass of articles. Such bodies are shown and described in the copending application of Lucian E. Parker, filed April 4, 1924, Serial No. 704,257. A conveyer belt or the like to be really effective in feeding articles from a hopper as is done in this apparatus, must have either a somewhat rough or other uneven surface by which the articles may be engaged, and such a conveyer or belt being used, it will be apparent that if a perfectly cylindrical roller 7 is employed, the rough or uneven surfaced belt in its travel will cause the desired bumping movement of the roller. I have found, however, that it is desirable to ensure adequate bumping movement of the roller by making it of substantial polygonal or other non-truly cylindrical form.

It will be obvious that, the roller 7 owing to its mounting in the links 9, is capable of a skewing motion whereby either of its ends may strike against the bottom of the hopper; or the whole length of the roller may strike against the bottom of the hopper, depending upon the manner in which the roller is acted upon by the conveyer 5. In any event, the roller is free to jump or bump around upon the conveyer at will.

For the purpose of supporting and guiding the conveyer 5, and for preventing articles from being thrown off of it at its sides, guards or guides 12 may be provided.

I have hereinbefore referred specifically to the use of my device for feeding waste matches, but it will be obvious that it is well adapted for feeding other articles.

Various changes in construction and arrangement of parts are contemplated as within the spirit of the invention and the scope of the following claims.

What I claim is:—

1. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of the discharge end beneath said hopper, and a bumping member arranged between the bottom of said hopper and normally in contact with the extension of said conveyer and acted upon by said conveyer to strike against the bottom of said hopper, for the purpose specified.

2. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end and beneath said hopper, and a bumping member pivotally supported between the bottom of said hopper and normally in contact with the extension of said conveyer and acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

3. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge and beneath said hopper, and a body of rotation arranged between the bottom of said hopper and the extension of said conveyer and acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

4. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end and under said hopper, and a roller mounted between the bottom of said hopper and the extension of said conveyer and adapted to be acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

5. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end and under said hopper, and a roller pivotally mounted between the bottom of said hopper and the extension of said conveyer and adapted to be acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

6. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end

and under said hopper, and a polygonal roller mounted between the bottom of said hopper and the extension of said conveyer and adapted to be acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

7. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end and under said hopper, and a polygonal roller pivotally mounted between the bottom of said hopper and the exension of said conveyer and adapted to be acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

8. In a feed device for belt conveyers, a hopper having an inclined bottom and a discharge end, a conveyer arranged adjacent to and travelling past said discharge end and extending back of said discharge end and under said hopper, and a noncylindrical roller mounted between the bottom of said hopper and the extension of said conveyer and adapted to be acted upon by said conveyer to cause it to strike against the bottom of said hopper, for the purpose specified.

In testimony whereof I have hereunto set my hand this 31st day of March A. D. 1924.

CHARLES ALBERS.