May 8, 1956 L. ALDRED 2,744,602

TABLET COUNTING AND BATCHING DEVICES

Filed July 31, 1952 2 Sheets-Sheet 1

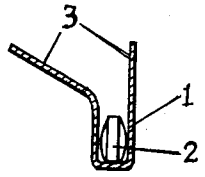


FIG. 1

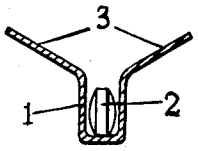


FIG. 2

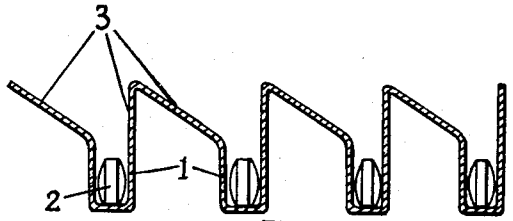


FIG. 3

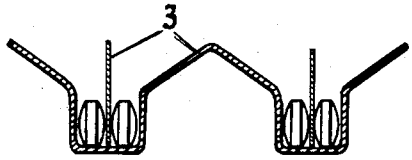


FIG. 4

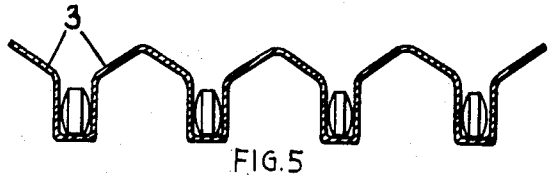


FIG. 5

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TABLET COUNTING AND BATCHING DEVICES

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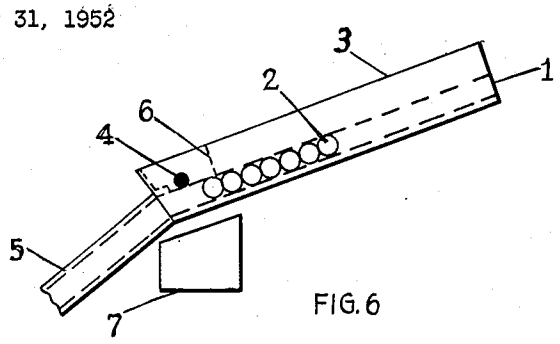


FIG. 6

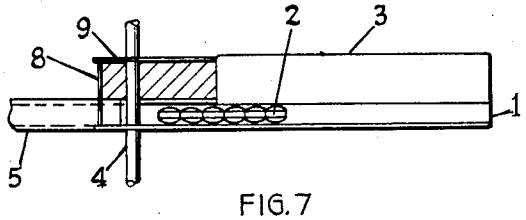


FIG. 7

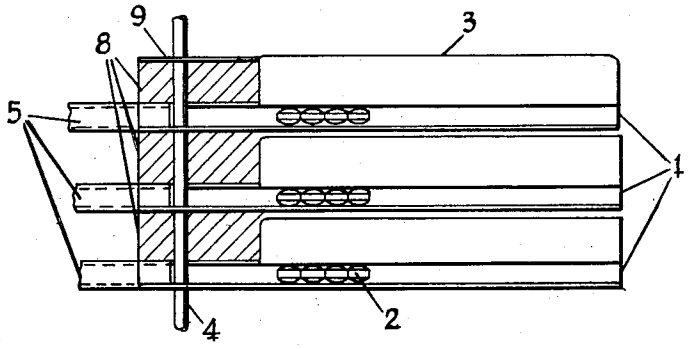


FIG. 8

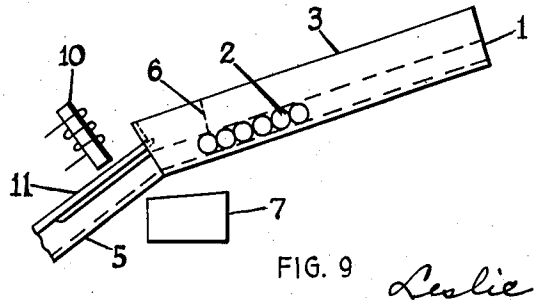


FIG. 9

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TABLET COUNTING AND BATCHING DEVICES

Leslie Aldred, Blackley, Manchester, England, assignor to Imperial Chemical Industries Limited, a corporation of Great Britain

Application July 31, 1952, Serial No. 301,865

Claims priority, application Great Britain August 3, 1951

3 Claims. (Cl. 193—38)

This invention relates to tablet counting and batching devices wherein tablets are caused to move down chutes in single file and more particularly to means for feeding tablets continuously into such chutes.

Means that have hitherto been proposed for feeding tablets into chutes include vibrating plates, oscillating bars and oscillating perforated plates in which the perforations are large enough to take one tablet. All of these means suffer from the disadvantages of slowness of working, breakage of tablets and clogging of mechanism with powder from the tablets.

It has now been found that a simple, approximately V-shaped guide with a groove running along the bottom of the V can be designed so that when the guide is suitably tilted and tablets are poured at random into the top of the guide they fall, slide or roll freely down and issue from the groove in single file provided that the rate of addition of tablets is not greater than the rate at which they roll down the groove. Tablets added in excess of this rate progress down the guide on top of the tablets in the groove and overflow at the bottom of the guide, where they can be collected in a suitable container and can be returned as desired to the top of the guide.

Thus according to one feature of the present invention there is provided a device for feeding tablets in single file into chutes which comprises an approximately V-shaped guide sloping at an angle of from 10° to 45° to the horizontal and having a groove running along the bottom of the V of depth greater than the tablet diameter and of width slightly greater than the tablet thickness and having at least one side bent out above the groove at an angle of from 45° to 90° to the vertical centre plane of the groove.

By vertical centre plane of the groove is meant either a plane parallel to the sides of the groove in the event that the groove has parallel sides or a plane bisecting the angle between the sides of the groove in the event that the groove is not parallel-sided.

The guide may be positioned so that the vertical centre plane of the groove is truly vertical or is inclined at an angle to the vertical to suit the chute, for example to make the tablets run in contact with one side of the chute.

A short portion of a sloping side of the guide, at the lower end, is, preferably, cut away so as to allow surplus tablets to overflow freely.

The length of the guide is not critical provided it is at least sufficiently long to ensure that the groove is filled with tablets for at least a short distance at the lower end. This minimum length will depend upon the size of the tablets, the inclination of the guide and the design of the guide; it can readily be determined by trial.

Tablets issuing from the groove in single file may be fed directly into a chute through an entrance just large enough to admit tablets in single file. If the chute becomes filled completely, or if a large excess of tablets overflows from the guides, there is a possibility that two or more tablet may lodge together in the entrance. It has been found however that this possibility can be completely obviated by providing a small diameter shaft or brush at the upper edge of the entrance, rotating in such

a direction that tablets in contact therewith are rolled upwards and out of the entrance, and it is a further feature of this invention so to do. By small diameter is meant a diameter less than 4 times the tablet diameter.

Alternatively a short portion of the top of the chute may be caused to vibrate and so prevent tablets from lodging against it.

If desired, two or more guides may be arranged side by side, feeding a group of chutes; a common shaft or brush may be fitted to the entrances to the chutes. Suitable deflector plates may be provided in order to guide overflowing tablets into a convenient container where, if desired, they may be continuously returned to the hopper feeding the guides.

The invention may be illustrated with reference to the accompanying drawings in which:

Figs. 1 and 2 show cross-sections of two forms of the guide.

Figs. 3, 4 and 5 show cross-sections of three forms of multiple guides.

Figs. 6 and 7 show, respectively, a side elevation and plan of a guide and overflow arrangement.

Fig. 8 shows a plan of a multiple guide and overflow arrangement.

Fig. 9 shows a side elevation of a guide and a chute with a vibrating portion.

In the drawings, tablets **2** rest in the groove **1** of a guide having one or both sides **3** bent out above the groove. A shaft or brush **4** rotates so as to roll tablets in contact therewith away from the entrance to the chute **5**. The side of the guide is cut away at **6** to allow surplus tablets to overflow into container **7**. In Figures 7 and 8, deflector plates are shown at **8** and **9**; the tablet overflow space is indicated by shading.

In Figure 9 an electromagnet **10**, energised with alternating current, causes a reed or brush **11** to vibrate above the entrance to the chute **5** and prevent tablets lodging.

By means of the device provided by this invention tablets can be fed rapidly in single file into chutes. Since there is no moving mechanism under the tablet path, no difficulty arises due to clogging with dust and there is no risk of damage to the tablets.

What I claim is:

1. In combination with a chute, a device for feeding tablets in single file into said chute which comprises an approximately V-shaped guide disposed at an angle of from 10° to 45° to the horizontal with its lower end adjacent the entrance to said chute, a groove running along the bottom of said guide, said groove being deeper than the tablet diameter and slightly wider than the tablet thickness, a planar guide surface extending from one side of said groove at an angle of from 45° to 90° relative to the vertical center plane of the groove, and means overlying the lower end of said guide adapted to prevent tablets not fully within said groove from jamming the entrance to said chute.

2. A device according to claim 1, wherein said jam preventing means is a rotating shaft.

3. A device according to claim 1, wherein said jam preventing means is a rotating shaft of diameter not exceeding four times the diameter of said tablets.

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