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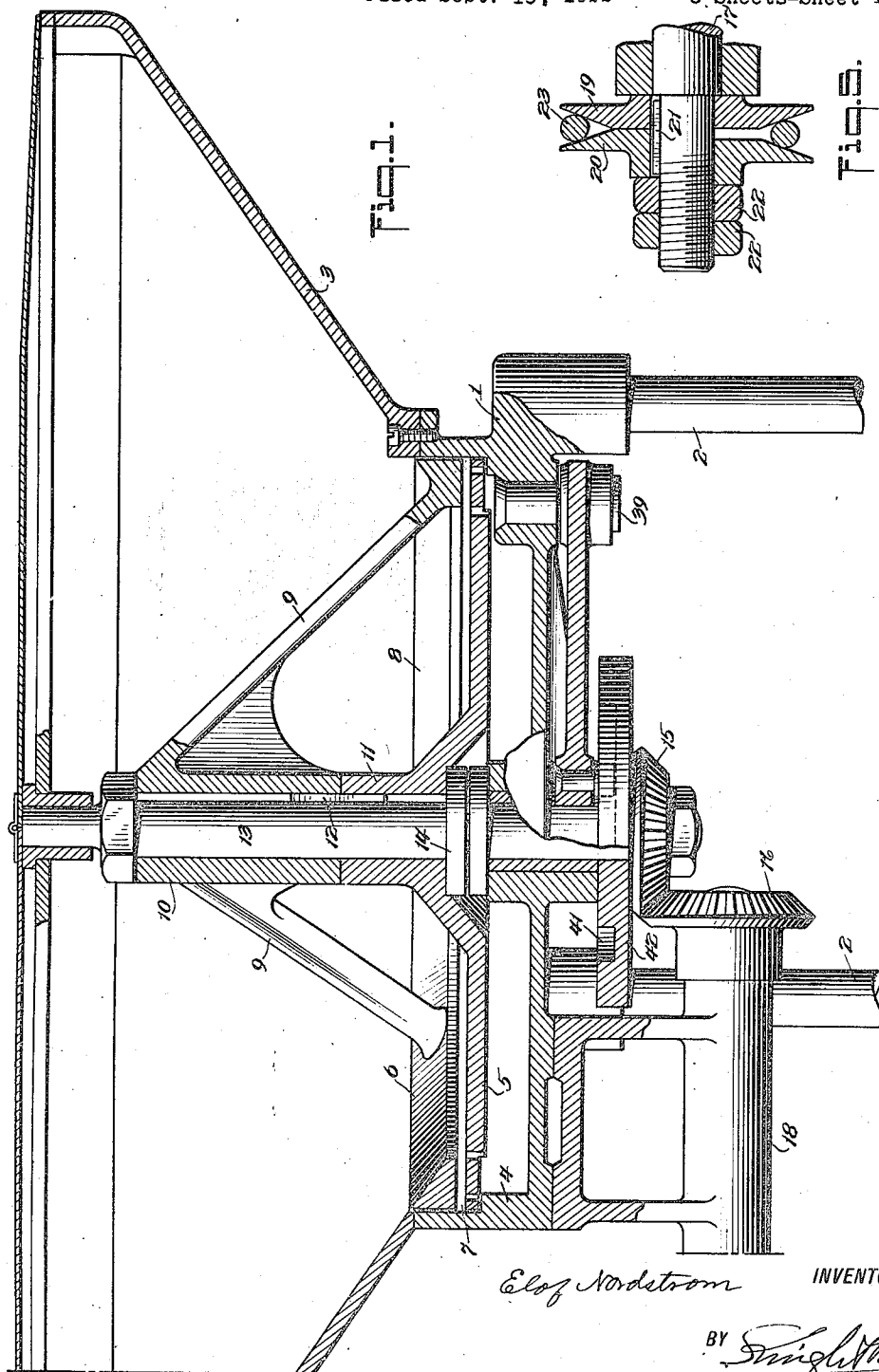
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E. NORDSTROM

ARTICLE FEEDING HOPPER

Filed Sept. 19, 1922

5 Sheets-Sheet 1



Elof Nordstrom

INVENTOR

BY

Wright & Co.

ATTORNEYS

July 22, 1924.

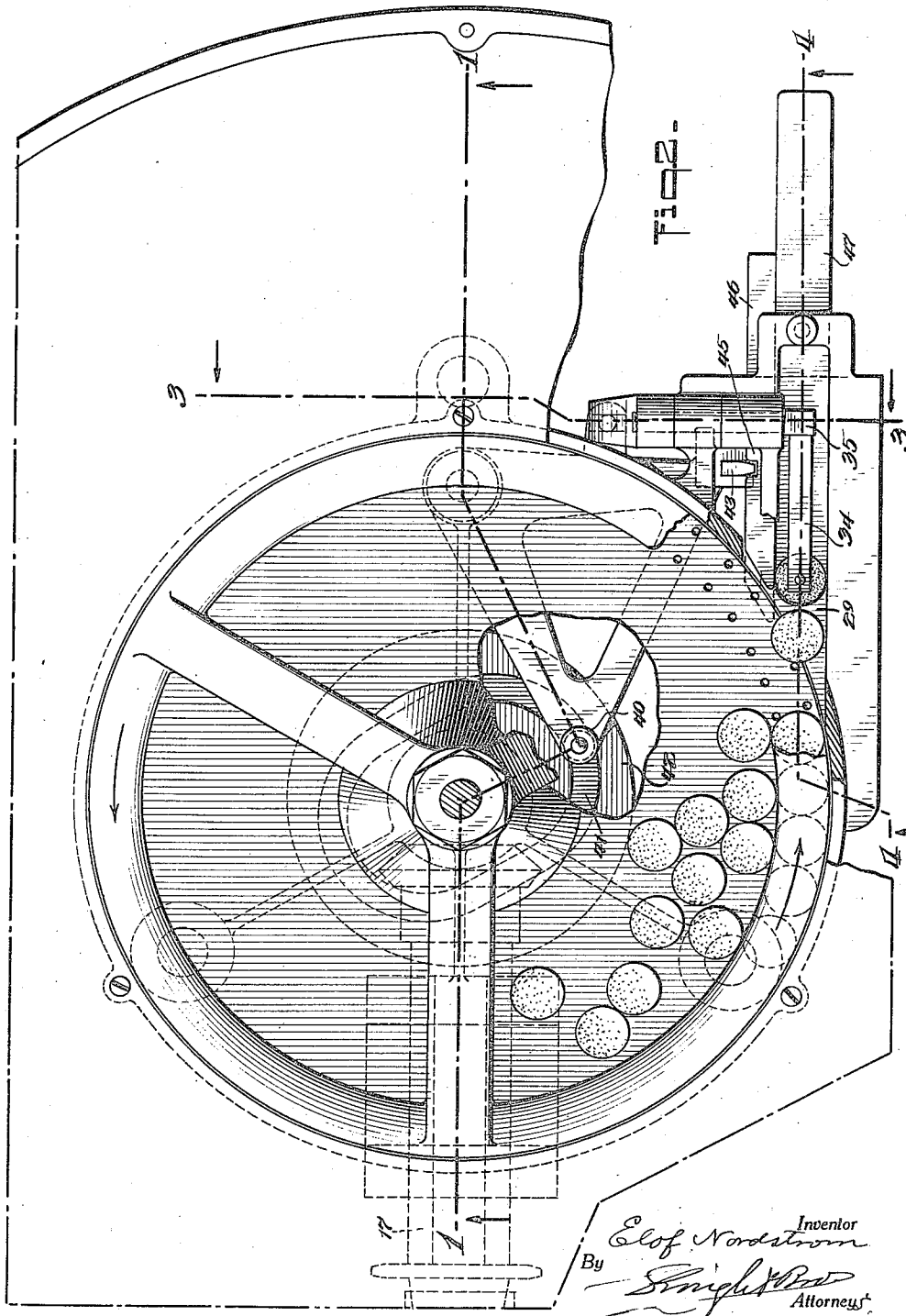
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ARTICLE FEEDING HOPPER

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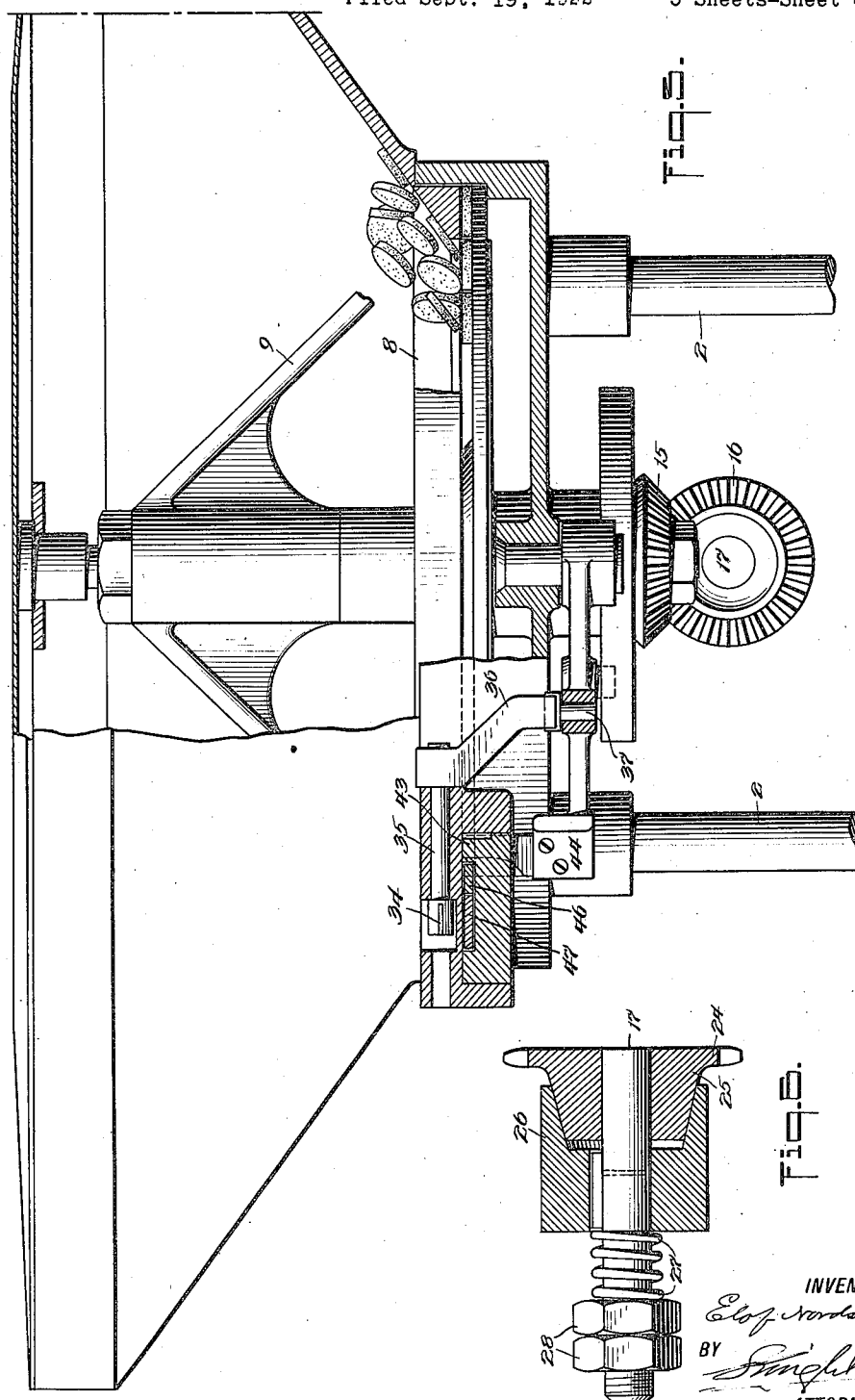
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ARTICLE FEEDING HOPPER

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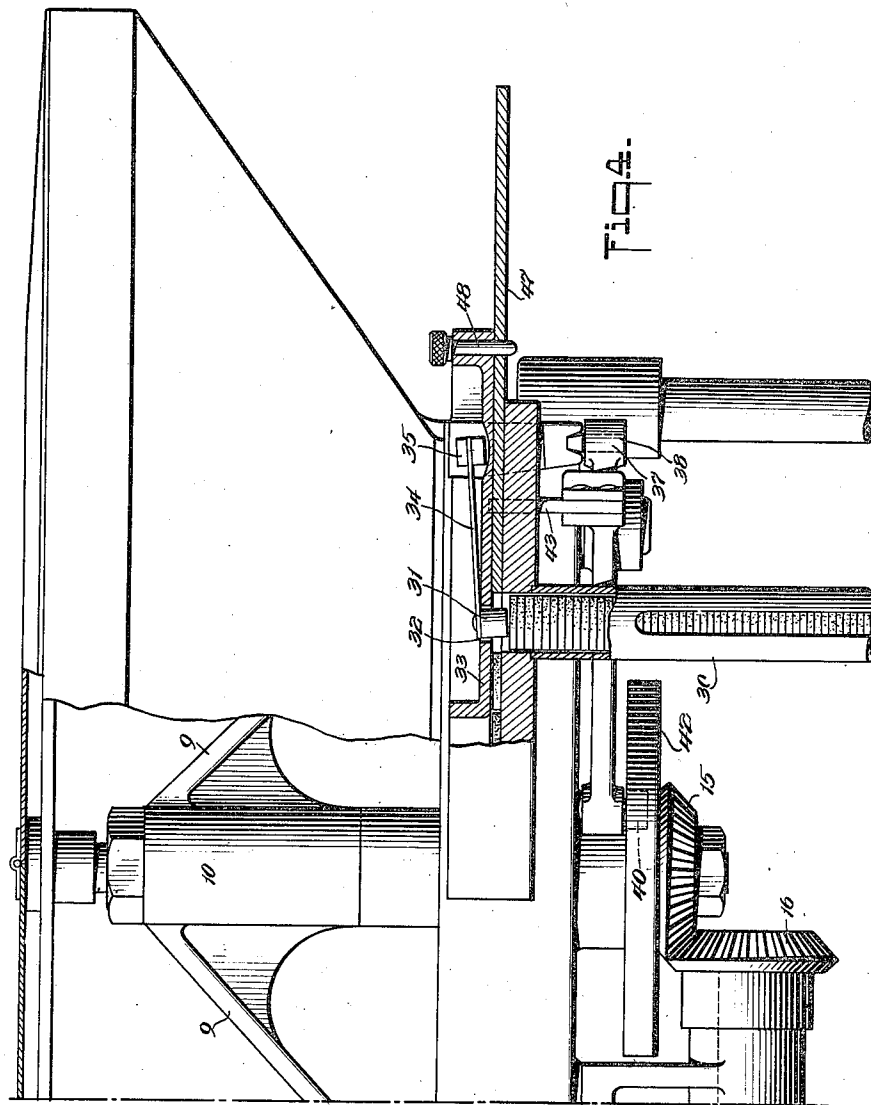
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E. Nordstrom Inventor
By *Smith & Brown* Attorneys

July 22, 1924.

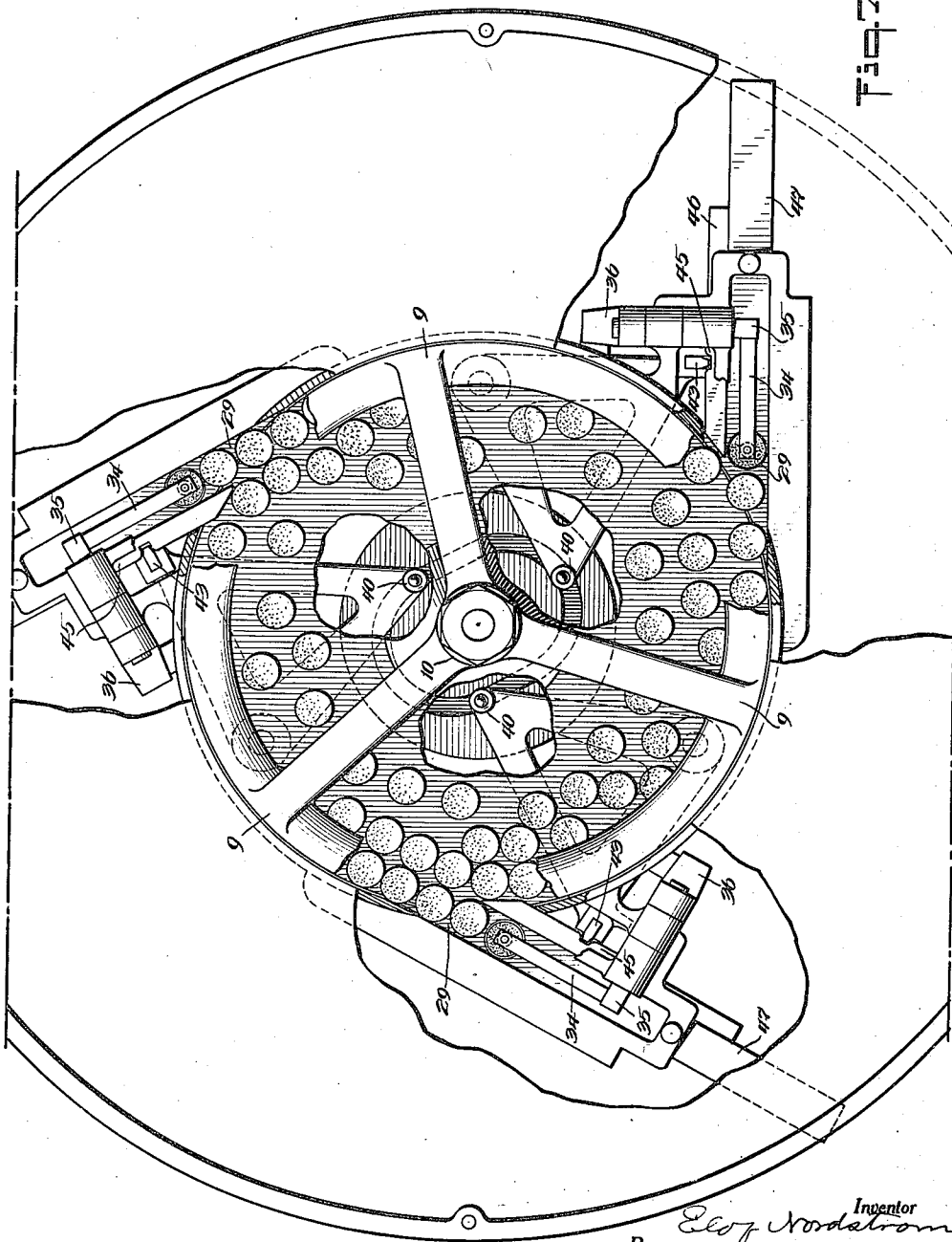
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E. NORDSTROM

ARTICLE FEEDING HOPPER

Filed Sept. 19, 1922

5 Sheets-Sheet 5



Inventor
E. Nordstrom
By
Smith & Brown
Attorney

UNITED STATES PATENT OFFICE.

ELOF NORDSTROM, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO AMERICAN DAN BOTTLE SEAL CORPORATION, OF DOVER, DELAWARE, A CORPORATION OF DELAWARE.

ARTICLE-FEEDING HOPPER.

Application filed September 19, 1922. Serial No. 589,154.

To all whom it may concern:

Be it known that I, ELOF NORDSTROM, a citizen of the United States, and a resident of East Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Article-Feeding Hoppers, of which the following is a specification.

This invention relates to a machine for automatically feeding articles such as bottle stoppers from a hopper into a proper receptacle from which they may be taken by a proper mechanism and applied to the bottle or vessel. The invention consists of certain improvements and the details of such a machine are hereinafter more specifically described and claimed.

Referring to the drawings:—

Figure 1 represents a vertical section thru an article feeding hopper embodying my improvements;

Figure 2 is a plan of the same with parts cut away to show detail;

Figure 3 is a vertical section on the line 3—3, Figure 2;

Figure 4 is a side elevation with a partial vertical section on the line 4—4, Figure 2;

Figure 5 is a section showing in detail the frictional drive for the operating shaft;

Figure 6 is a sectional view of an alternative form of frictional drive; and

Figure 7 is a plan view similar to Figure 2, showing an embodiment of my invention in a machine which discharges at a plurality of points around the hopper.

A frame 1 mounted on legs 2, and carrying a conical hopper 3 is formed with a cylindrical chamber 4. In this chamber rotates a distributing disc 5 which forms the bottom of the hopper and the annular ring 6 which forms with the disc 5 an annular slot 7 for the reception of a single layer only of the articles. The annular ring 6 is inclined on its upper surface 8 and this surface forms a continuation of the inclined inner surface of the hopper. Carrying ribs 9 unite the annular ring to a hub 10 and the disc 5 also has a hub 11. Both these hubs are keyed at 12 to the central driving shaft 13. The driving shaft is supported on ball-bearing 14 and is driven by bevel wheels 15 and 16 from a horizontal shaft 17 journaled in the frame at 18. The shaft 17 is preferably driven by a frictional drive and I have shown in Figure 5 one means

of accomplishing this. A groove pulley consisting of two members 19 and 20 are driven by key 21 in the shaft 17 and by means of nuts 22, the parts 19 and 20 may be adjusted axially with respect to each other so as to vary the effective driving diameter for the rounded belt 23. In Figure 6, I have shown an alternative method. In this case a sprocket wheel 24 is mounted loosely on shaft 17 and has a conical hub 25 that engages in frictional contact a corresponding taper on hub 26 which is keyed at 27 to the shaft 17. The hub 26 can move freely along the shaft and is held in frictional contact with the wheel 24 by a drive 27 which in turn has its abutment against nuts 28 with which its tension can be adjusted.

In my previous Patents No. 1,212,665, dated January 16th, 1917, and No. 1,276,562, dated August 20th, 1918, I have shown certain means for distributing the articles from a hopper to a receptacle. The present invention differs from those forms in that the distributing means in the present case are reduced to the simplest possible form, namely, a rotating disc forming the floor of the hopper and an annular ring spaced the thickness of one article above the disc and rotating with it. I have found that this simple arrangement distributes the article in a satisfactory manner in a single layer around the periphery of the disc by centrifugal force, the same being aided by the agitation caused by the ribs 9. It will be seen that the annular space into which the articles placed is nicely adjusted by the abutting together of the hubs 10 and 11 and it is evident that the whole rotating distributing element presents a mechanical solution of the problem with the greatest possible simplicity in the absence of articulating or moving parts.

As the articles travel along their circular path, they meet either a single tangential slot 29, according to Figure 2 or one of a plurality of tangential slots 29 according to Figure 7, said slot or slots being made in the frame of the machine. As the articles are pushed along a tangential slot they drop into a vertical tube 30 in which they accumulate and from which they are drawn off by other mechanisms which form no part of this invention. A knocker 31 operating thru an orifice 32 in the cover plate 33 pushes the article into the tube one after the other.

This knocker is carried on a spring arm 34 which in turn thru a rock shaft 35 and rocker arm 36 is given a rocking motion by a pivotal tooth 37 mounted in a bell crank arm 38. This bell crank arm is pivoted at 39 in the frame of the machine and has at 40 a cam roller and pin which travelling in a slot 41 in cam 42 gives the necessary reciprocating motion to the bell crank. This bell crank also has a tooth 43 clamped to the bell crank at 44 (see Figure 3) and this tooth by engaging with slot 45 in a reciprocating agitator bar 46 causes the same to move from the full line position to the dotted line position shown in Figure 2. The object of this agitator is to properly aline the articles as they pass into the discharge passage as set forth in my previous patent. I have found however, that it is very important that this agitator should not protrude too far into the path of the articles being distributed. Experiment has shown that the proper path for the agitator is from the point just outside of the perimeter of the annular channel to a point just inside of such perimeter. The agitator does not in my present invention push the articles entirely out of the annular slot into which they have been driven and for this reason I obtain a more uniform and more continuous distribution of the articles. The articles as they come into registry with the tube 30 abut against the stop 47 which stop is held in position by pin 48 and can be readily removed for the purpose of cleaning.

It will be obvious from an inspection of Figure 7, that within certain limits, any desired number of tangential slots 29 may be embodied in this structure. While I have shown only three of said slots in Figure 7, it will be readily understood that by enlarging the diameter of the hopper, it becomes possible to accommodate, a greater number of tangential passageways.

It will be understood that the frictional drive is rendered necessary by the possibility of the hopper becoming clogged either from the accumulation of dust or broken particles or from any other cause.

I claim:—

1. In an article feeding mechanism the combination of a hopper and an article selecting means located at the base of the hopper and consisting of a rotating member having two parts spaced rigidly with respect to each other with a space between them that will admit but one layer of the article.

2. In an article feeding mechanism the combination of a hopper and an article selecting means located at the base of the hopper and consisting of a rotating member having two parts spaced rigidly with respect to each other with a space between

them that will admit but one layer of the article, and a frictional drive for said member.

3. In an article feeding mechanism the combination of a hopper and an article selecting means located at the base of the hopper and consisting of a rotating member having two parts spaced rigidly with respect to each other with a space between them that will admit but one layer of the article, and an adjustable drive for said member.

4. An article feeding machine comprising a feeding hopper, a rotating distributor in the bottom of the hopper and an agitator for alining the articles at their point of exit from the hopper, the said agitator having a reciprocating motion from a point just outside to a point just inside of the perimeter of the distributor.

5. An article feeding mechanism comprising a hopper, a rotating distributor in the bottom of the hopper, a vertical shaft carrying said distributor, an agitator for alining the articles, and mechanism for reciprocating the agitator.

6. An article feeding mechanism comprising a hopper, a rotating distributor in the bottom of the hopper, a vertical shaft carrying said distributor, an agitator for alining the articles, other mechanisms for depressing the articles into a receptacle, and means for driving said agitator and other mechanisms.

7. An article feeding mechanism comprising a hopper, a rotating distributor in the bottom of the hopper, a vertical shaft carrying said distributor, an agitator for alining the articles, means for depressing the articles into a receptacle and means articulately connecting said shaft with said agitator and depressing means.

8. Article feeding mechanism comprising a hopper provided with a tangential outlet, a centrifugal distributor arranged in the bottom of said hopper, said centrifugal distributor being provided with a peripheral calipering slot of uniform size extending thruout the entire periphery of said distributor and in communication with said outlet.

9. In an article feeding machine, the combination with a hopper provided with a plurality of tangential discharge outlets of a centrifugal distributor provided with a calipering slot presented inwardly toward the rotary axis of said centrifugal distributor and entirely around said axis, said calipering slot being open around the outer periphery of said distributor to permit the centrifugal discharge of the articles into said outlets.

ELOF NORDSTROM.