April 7, 1953 W. K. WYATT, JR 2,634,022

FEED MECHANISM

Filed Feb. 14, 1951 2 SHEETS—SHEET 1

Fig. 1.

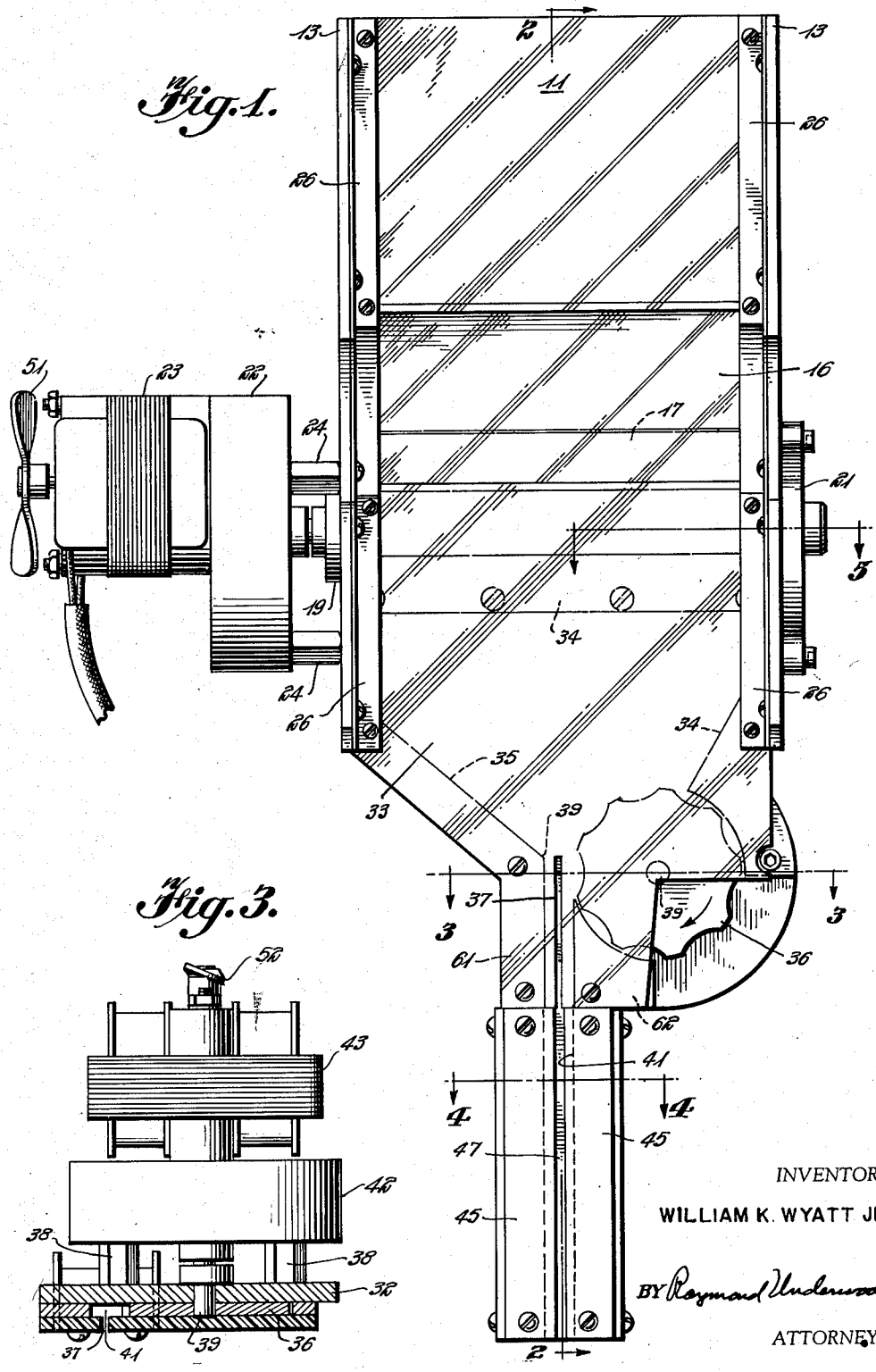

Fig. 3.

INVENTOR

WILLIAM K. WYATT JR.

BY Raymond Underwood

ATTORNEY

April 7, 1953 W. K. WYATT, JR 2,634,022

FEED MECHANISM

Filed Feb. 14, 1951 2 SHEETS—SHEET 2

Fig. 2.

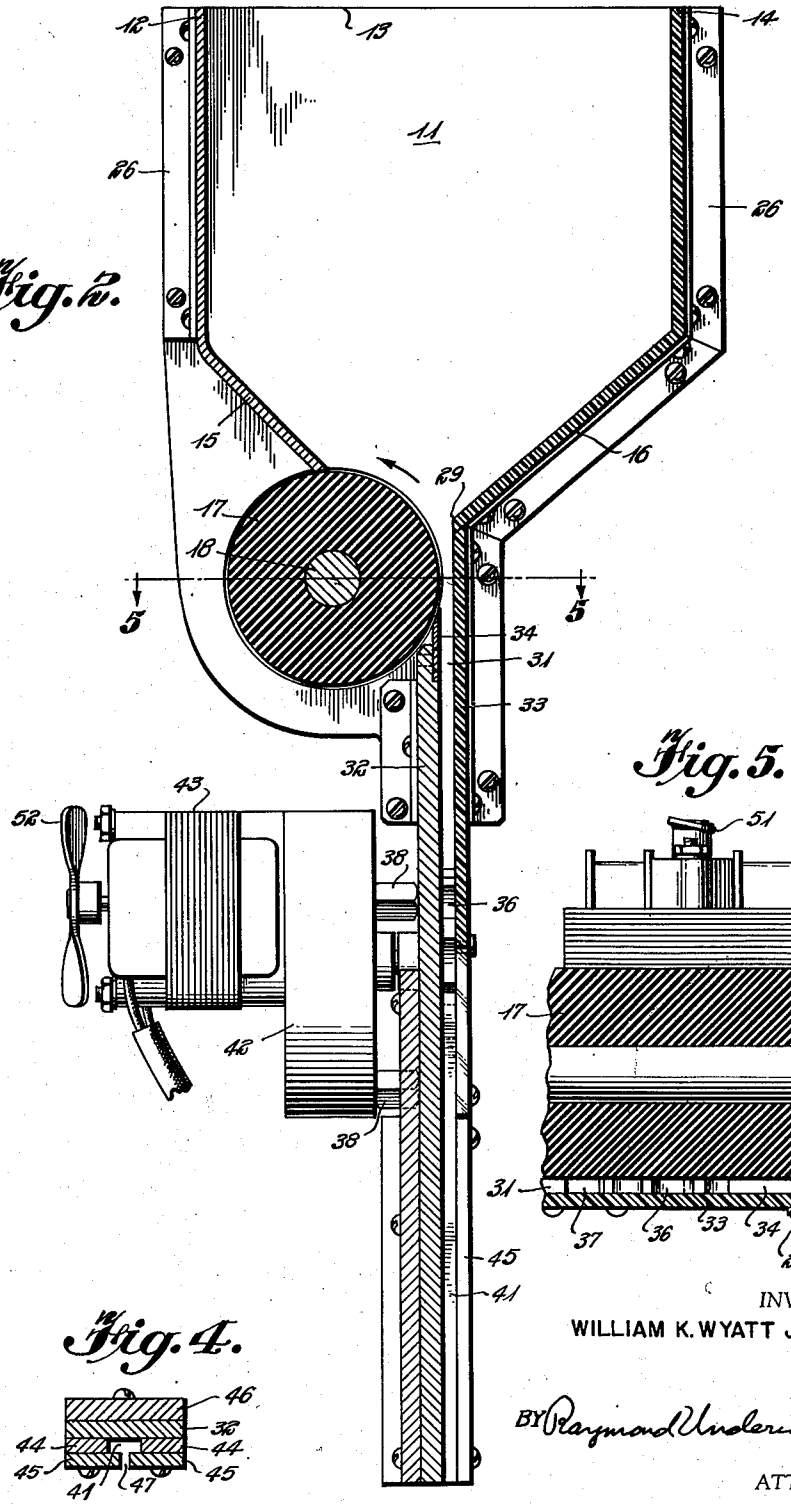

Fig. 5.

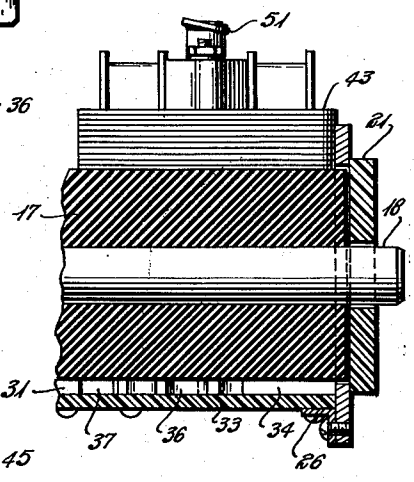

Fig. 4.

INVENTOR
WILLIAM K. WYATT JR.

BY Raymond Underwood

ATTORNEY

Patented Apr. 7, 1953 2,634,022

UNITED STATES PATENT OFFICE

2,634,022

FEED MECHANISM

William Kirk Wyatt, Jr., Souderton, Pa., assignor to Sharp & Dohme, Incorporated, Philadelphia, Pa., a corporation of Maryland

Application February 14, 1951, Serial No. 210,840

1 Claim. (Cl. 222—10)

1

This invention is concerned with a mechanism for arranging and feeding tablets, cores, pellets, disks, and the like.

An object of the invention is to provide a means for arranging tablets, disks and the like existing as a jumbled, disordered mass, into an orderly arrangement and to provide a rapid, continuous supply of tablets for feeding to whatever delivery point it is desired to supply.

Prior to this invention mechanisms for arranging and feeding tablet and cores have contained a plurality of rollers which added to the complexity of the mechanism and made easy visual observation difficult if not impossible.

A feature of this invention is the simplicity of the mechanism required and the effective rapid, continuous arranging and feeding resulting from mechanism of the invention. A further feature of the invention is that it requires only a single cylindrical roll to provide agitation of the contents of the hopper in distinction to presently known arranging and feeding means. This is particularly advantageous in that the side of the exit slot opposite the cylindrical roll can be made of a transparent material providing easy visual inspection of the contents of the exit slot whereby malformed or broken tablets can be observed and measures taken to effect their removal as they issue in the tablet stream from the channel-way.

A further feature of this invention is the wheel at the bottom of the exit slot having indentations in the periphery, which indentations cause agitation of the layer of tablets in the exit slot and prevent arching and consequent interruption of feed to the channel-way.

The features of this invention and the operation of the mechanism of this invention are more fully set forth in the following description of the mechanism of this invention.

Figure 1 is a front elevation of the mechanism of this invention.

Figure 2 is a vertical section of the mechanism of this invention.

Figure 3 is a sectional view of the line 3—3 in Figure 1.

Figure 4 is a section view on the line 4—4 in Figure 1.

Figure 5 is a section on the line 5—5 in Figure 2.

The mechanism of this invention comprises a hopper and exit slot, a channel-way and operating means.

These operating means are twofold. First, means is provided to cause agitation of the contents of the hopper causing the tablets to form into a vertical layer in the exit slot. Second,

2

means is provided to arrange the tablets in the vertical layer into a vertical file in the channel-way.

Referring to Figures 1 and 2, the hopper 11 is composed of a back plate 12, two side plates 13 and transparent front plate 14. The upper portion of the hopper conveniently has a rectangular horizontal cross section. The bottom of the hopper is of wedge shape. This portion of the hopper 11 is composed of an angularly displaced lower portion 15 of the back plate 12, and an angularly displaced lower extension 16 of the transparent front plate 14. These two portions 15 and 16 converge. The sides 12, the front plate 14, and lower extension 16, and the back plate 12, and lower extension 15 are supported by means of angles 26.

The plate 15 is interrupted along a portion of its lower surface by a cylindrical roll 17. The cylindrical roll 17 is fixed to a supporting shaft 18. The axis of shaft 18 is parallel to the line of convergence of the lower portions of the plates 15 and 16. The shaft 18 is rotatable in the two bushings 19 and 21 supported on the two side plates 13. The shaft 18 is powered by an electric motor 23 through an enclosed reduction gear 22. The electric motor, as here shown, is attached to the reduction gear as part thereof and the reduction gear is bolted to the side plate 13 and separated therefrom by a number, conveniently three, of spacers 24.

The converging sides 15 and 16 together with the roll 17 comprise the bottom of the hopper. The sides 15 and 16 are sloped so as to direct the pills, tablets or the like in the hopper 11 toward and in contact with the surface of the roller 17. The roller projects into the hopper above the plane of the fore-shortened bottom side 15, thus acting upon the contents of the hopper 11. The bottom of the hopper is open between the roll 17 and the side 16 and this opening is the entrance to the exit slot 31.

The exit slot 13 extends the length of the roller 17 and is defined by a back plate 32, a front plate 33 and, in its upper portions, by the two side plates 13. As shown here the exit slot 31 is further defined in one plane by a horizontal knife-edged piece 34 attached to the upper edge of the back plate 32 which is so positioned as to position its inner surface as to be tangent to the cylindrical roll 17. It is to be understood that the knife-edge 34 can conveniently be integral with the back plate 32 or can be detachable for ease of replacement. The width of the exit slot 31 is only slightly greater than the thickness of the particular article being handled in the mechanism. The

exit slot 31 provides a space wherein the tablets coming from the hopper 11 are arranged into a vertical layer, and fed to the channel-way 41.

The front plate 33 and the back plate 32 are supported by means of the angles 26 which are in turn supported by the side plates 13. The line 29 formed by the intersection of the plates 16 and 33 is positioned as to be in a horizontal plane above the axis of rotation of the shaft 18.

The lower portion of the exit slot is V-shaped and is defined by the back plate 32, the front plate 33, the bottom plate 34 and 35 and a wheel 36. The converging bottom plates 34 and 35 are supported between the front plate 33 and the back plate 32 by conventional means. The bottom edge 34 is interrupted by a wheel 36 having an indented periphery. The wheel 36 is fixed to a supporting shaft 39. The shaft 39 pierces the back plate 32 and is powered through an enclosed reduction gear 42 by an electric motor 43. The motor 43 is fixed to the reduction gear 42 which conveniently is supported by means of bolts to the back plate 32 and is separated therefrom by spacers 38.

The wheel 36 has an indented periphery and its axis of rotation is in a horizontal plane below the line 39 formed by the lower edge of the bottom plate 35. This results in the wheel 36 projecting into the V-shaped portion of the exit slot 31 and providing a jostling motion to the layer of tablets contained therein. The depth and arcuate length of the indentations on the wheel 36 is proportional to the diameter of the tablets being handled. That is, the larger the tablet being handled the greater the arc encompassed by the indentation.

The throat 37 at the bottom of the exit slot 31 leads to the channel-way. This throat 37 is defined by the back plate 32, the front plate 33 and the sides 61 and 62. The front plate, and the sides 61 and 62 are supported on the back plate 32. The throat 37 is of the same thickness as the exit slot 31 and is of a width only slightly greater than the diameter of the tablet or core being handled. This throat 37 is vertical and leads to the channel-way 41.

The channel-way 41, as illustrated in Figure 4, is defined by the back plate 32, two side members 44, and two front members 45. The front members 45 are attached through the side plates 44 and the back plate 32 to a support member 46 which supports the entire channel-way 41 and is in turn attached to the back plate 32 of the exit slot 31. The two side members 44 are positioned as to be in vertical alignment with the sides 61 and 62 of the throat 37. That is, they are separated by a distance only slightly greater than the diameter of the tablet or core being handled. The side members 44 are of a thickness only slightly greater than the width of the tablet being handled. The two front members 45 are so positioned as to leave a slot 47 in the front, providing access to the channel-way 41 in order to afford a means of dislodging any broken or damaged cores or tablets.

Figure 3 is a section view on the line 3—3 in Figure 1 and illustrates the channel-way 41 at the throat 37, the wheel 36, its shaft 39, the motor 43, the reduction gear 42, and the spacers 38, together with the fan 52 which provides cooling for the motor 43.

Figure 5 is a vertical section on the line 5—5 in Figure 1. It illustrates the cylindrical roll 17, the supporting shaft 18, the bushing plate 21 and in the background the motor 43 which powers the wheel 36. Also shown is the vertical front plate 33 and the lower extension of the supporting angle 26. Further, there is illustrated the throat 37 adjacent to the wheel 36. Each of the electric motors 23 and 43 are equipped with self-cooling fans, 51 and 52 respectively.

In the operation of the mechanism of this invention the tablets, cores, disks, or the like to be arranged and fed are dumped into the hopper 11 where they exist as a jumbled, disordered mass. The cylindrical roll 17 revolves upwardly with respect of the line 5—5 as indicated in Figure 2, causing an agitation of the contents of the hopper. Due to the action of this cylindrical roll and gravity the tablets fall into the exit slot 31 forming a vertical layer. As the tablets in the form of a vertical layer fill the exit slot 31 and especially the lower V-shaped portion thereof defined by the bottom plates 34 and 35 and the front and back plates 32 and 33 they are acted upon by the wheel 36 revolving as indicated in Figure 1, upwardly with respect to the line 3—3, so as to produce a gentle jostling motion of the contents of the exit slot 31. This motion prevents any bridging or arching of the tablets and interruption of the flow of tablets into the throat 37 and thence to the channel-way 41. As the tablets one by one enter the throat 37 they fall into the channel-way 41 and thence are conducted to whatever point it is desired to feed the tablets.

What is claimed is:

In a tablet feeding mechanism, the combination of a hopper having a sloped bottom surface, a single horizontal roll, said roll and the lower edge of sloped bottom surface defining opposite boundaries of the hopper exit, said sloped bottom surface being angularly upwardly disposed relative to the horizontal plane of the axis of rotation of said roll so as to direct the hopper contents on to and in contact with said roll, a hopper exit slot the width of which is defined by opposite boundaries separated by a distance slightly greater than the tablet being handled, said hopper exit slot having a V-shaped lower portion, a wheel within said hopper exit slot forming a side wall thereof having an indented periphery, means for constantly rotating said roll and said wheel in one direction so that the portions thereof contacting the tablets move in an upward direction, said wheel positioned adjacent to the exit throat of the hopper exit slot and the axis of rotation of which is 90° displaced from the axis of rotation of the single horizontal roll, said exit throat being but slightly larger in cross section than the cross sectional dimension of the tablet whereby the tablets are discharged in a single line file therethrough.

WILLIAM KIRK WYATT, JR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,750,310	Jonkel et al.	Mar. 11, 1930
2,284,975	Horner	June 2, 1942
2,509,069	Mrachek	May 23, 1950
2,561,412	Potter	July 24, 1951