Dec. 30, 1952 M. J. KUSS 2,623,634

GRAIN COOLING AND SCREENING MEANS

Filed June 3, 1949 2 SHEETS—SHEET 1

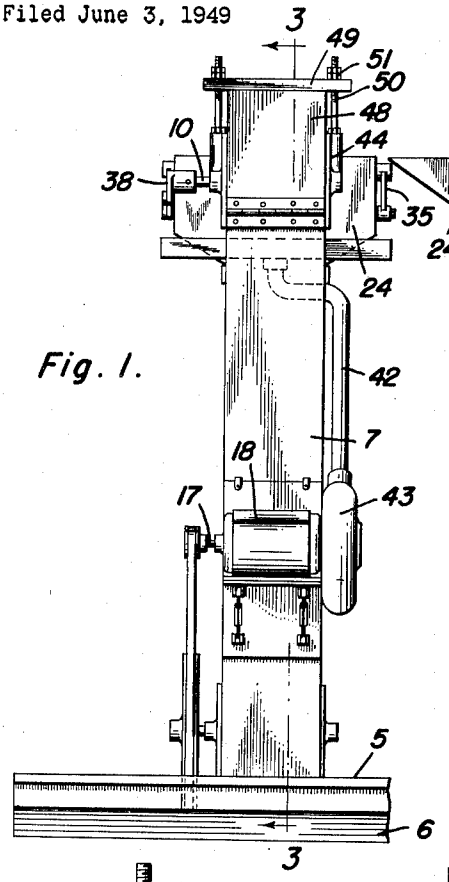


Fig. 1.

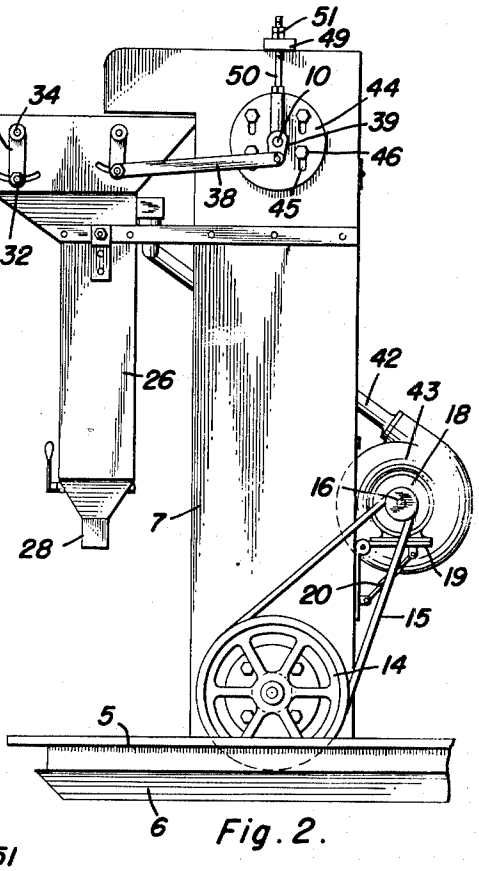


Fig. 2.

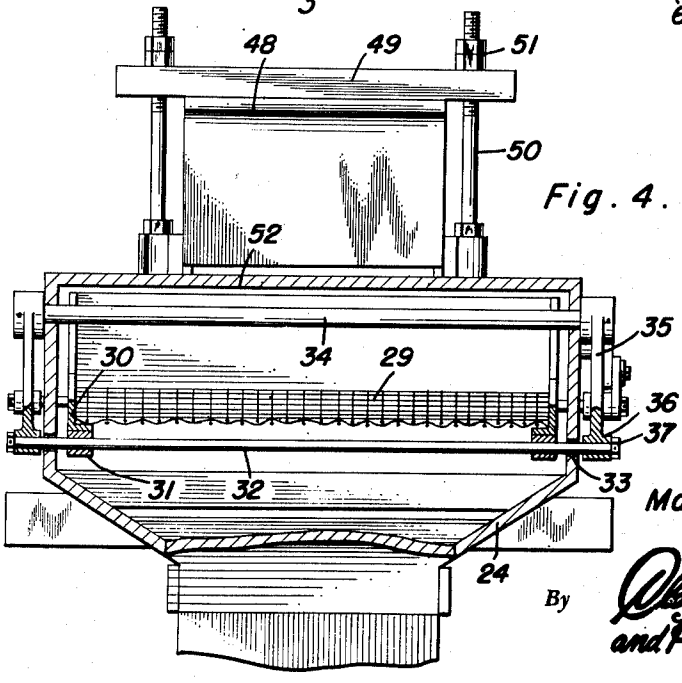


Fig. 4.

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GRAIN COOLING AND SCREENING MEANS

Filed June 3, 1949 2 SHEETS—SHEET 2

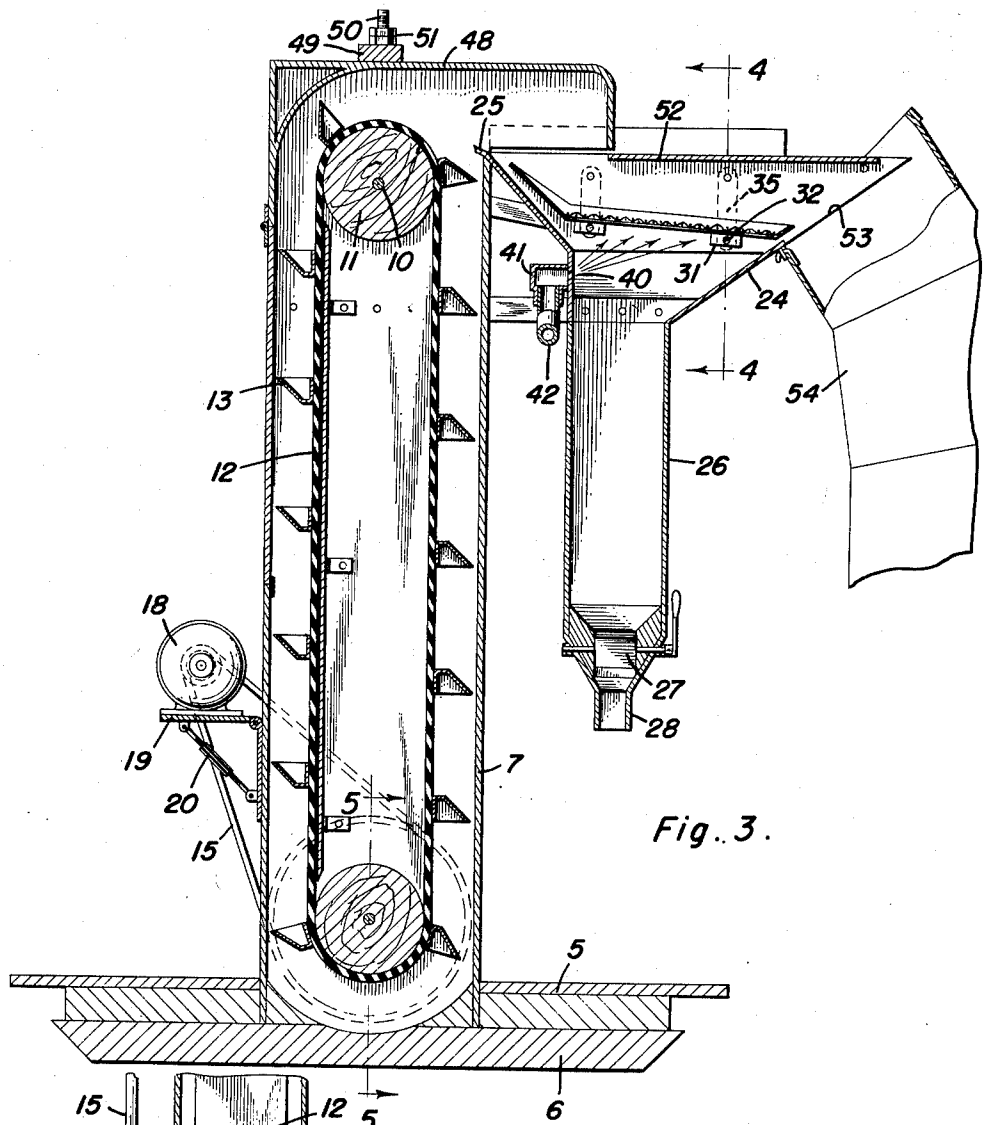


Fig. 3.

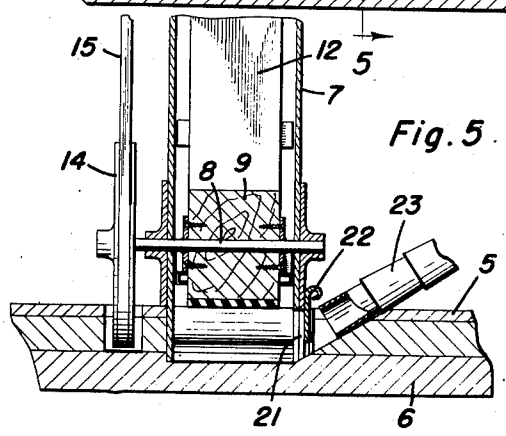


Fig. 5.

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Patented Dec. 30, 1952

2,623,634

UNITED STATES PATENT OFFICE

2,623,634

GRAIN COOLING AND SCREENING MEANS

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Application June 3, 1949, Serial No. 96,933

1 Claim. (Cl. 209—27)

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The present invention relates to new and useful improvements in grain cleaning, cooling and drying machines, and more particularly to a portable machine of this character which may be easily and quickly moved into position adjacent a grain bin and by means of which the grain may be cleaned, cooled and dried and the cleaned grain either bagged or returned to an empty bin.

An important object of the invention is to provide a portable grain elevator by means of which grain from a storage bin may be elevated onto a shaker screen for cleaning the grain and subjecting the grain to a draft of air for drying and cooling the grain.

A further object of the invention is to provide an electric motor supported on the machine for driving the elevator, agitating the shaker screen and for operating a blower to supply air to the grain for cleaning the same.

A further object is to provide a machine of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a rear elevational view;

Figure 2 is a side elevational view;

Figure 3 is an enlarged vertical sectional view taken on the line 3—3 of Figure 1;

Figure 4 is an enlarged transverse sectional view taken on the line 4—4 of Figure 3; and

Figure 5 is a fragmentary vertical sectional view taken on the line 5—5 of Figure 3.

Referring now to the drawings in detail wherein, for the purpose of illustration, I have disclosed a preferred embodiment of my invention, the numeral 5 designates a supporting base or platform mounted on skids 6 and from the central portion of which a vertical elevator housing 7 rises.

A shaft 8 is journaled in the lower side walls of housing 7 and to which a lower pulley or roller 9 is suitably secured for rotation with the shaft and a shaft 10 is journaled in the upper portion of side walls of housing 7 and one which an upper idler pulley or roller 11 is journaled. An endless conveyor belt 12 is mounted to travel on pulleys 9 and 11 and is provided with buckets 13 suitably secured to the outer surface of the belt.

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A pulley 14 is secured to one end of shaft 8 outwardly of housing 7 and is driven by a belt 15 from a pulley 16 at one end of the shaft 17 of an electric motor 18 which is mounted on a vertical swinging shelf 19 hinged to the rear of elevator housing 7 and secured in vertically adjusted position by a turnbuckle brace 20 to tighten the belt 15 by the adjustment of shelf 19.

One side of elevator housing 7, at its lower portion, is formed with a grain inlet opening 21 controlled by a sliding door 22 for supplying grain to the lower portion of the elevator housing 7 under the elevator or conveyor belt 12 by means of a flexible pipe or hose 23 leading from a grain storage bin (not shown).

A throat or funnel structure 24 is suitably secured to the upper portion of housing 7 with the upper inner edge of the throat or funnel structure 24 projecting into the top of housing 7, as shown at 25, in a position for receiving grain from the buckets 13 as they travel over the top of upper pulley 11 to deposit the grain into the throat or funnel structure 24. A chute 26 leads downwardly from the lower portion of throat or funnel structure 24 with a cut-off valve 27 in its lower portion and a reduced neck 28 under the cut-off valve and supported in an elevated position above one end of platform 5 and by means of which the grain may be placed in bags when resting on the platform, or the grain may be returned to an empty storage bin by attaching a flexible hose or pipe (not shown) to the neck 28.

A screen 29 is positioned in throat or funnel structure 24 and includes a screen frame 30, to the under side of which bearings 31 are suitably secured and in which a pair of lower shafts 32 are journaled, the ends of the shafts projecting outwardly through arcuate slots 33 in the opposite side walls of throat or funnel structure 24.

A pair of upper shafts 34 are rockably journaled in the side walls of the throat or funnel structure 24 and to the ends of which hangers 35 are suitably secured and with the lower ends of the hangers provided with bearings 36 in which the ends of lower shafts 32 are journaled. The shafts 32 are secured in the bearings 36 by nuts 37 threaded on the ends of the shafts to permit removal of the shafts from the screen to permit substitution of other types of screens in accordance with the character of the grain being cleaned.

One end of a pitman arm 38 is pivotally attached to the innermost lower shaft 32 and the inner end of pitman arm 38 is pivoted to a crank

arm 39 secured to one end of upper shaft 10 of the elevator.

The rear wall of throat or funnel structure 24 is formed with a horizontal, upwardly inclined slot 40 below screen 29 and a chamber 41 is suitably secured to the rear surface of chute 26 over slot 40 and to which an air hose or pipe 42 is attached, leading from a blower 43 attached to one end of motor 18 for driving the blower by the shaft 17 of the motor.

The upper pulley or roller 11 is adjustable vertically to tighten elevator belt 12 by journalling the ends of shaft 10 in bearing plates 44 positioned outwardly at the sides of housing 5 and providing the bearing plates with vertical slots 45 in which stud bolts 46 are positioned and threaded to the housing.

The top of housing 5 projects laterally to overlie throat or funnel structure 24 and the top includes stationary side walls 47 and a hinged cover 48 between the side walls to afford access to the elevator. The cover 48 is clamped in a closed position by a cross bar 49 resting on top of the cover and secured to upstanding rods 50 by nuts 51, the rods being suitably supported by the bearing plates 44.

The cover 48 partly covers throat or funnel structure 24 and the remaining portion thereof is closed by a removable cover 52 suitably secured in position on top of the throat or funnel structure.

The outer side of throat or funnel structure 24 is provided with an opening 53 above the plane of screen 29 leading to a pipe or hose 54 for conveying chaff or dirt from the machine by the action of air blown upwardly through the screen.

In the operation of the device, grain is supplied to the bottom of elevator housing 5, from a bin or the like, by hose 23 and the grain is lifted to the top of the elevator by buckets 13 and deposited onto screen 29, where it is cleaned by the shaking action of the screen, the clean grain passing through the screen into chute 26 for bagging or returning to a storage bin.

As the grain is being cleaned, air is blown upwardly through the screen and through the grain for removing dirt, chaff and light foreign substances which are carried into disposal pipe 54 and heavier foreign substances are also deposited into pipe 54 by the shanking action of the inclined screen.

The air also dries and cools the grain to prevent spoiling thereof.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claim.

Having described the invention, what is claimed as new is:

A portable grain cleaning and cooling machine for discharging cleaned and cooled grain into bags comprising a platform for supporting a bag, an elevator housing rising from the platform and having a bottom grain receiving door and a laterally projecting top portion having a bottom grain discharge opening, a grain elevator in said housing for elevating grain to said discharge opening, a funnel structure at said side of the housing having a rear open top portion directly beneath said discharge opening for receiving grain from the discharge opening, said structure having a front chaff discharge opening remote from said open top portion and being closed at its top between said open top portion and chaff discharge opening, a shaker screen in said funnel structure for screening grain in the funnel structure, and a grain discharge chute depending from said funnel structure below said screen in suspended position and spaced from said side of said housing for discharging screened grain into a bag supported on the platform, and means for passing air upwardly through said chute and screen and through said chaff discharge opening, said means being at the back of said chute in an out-of-the-way position.

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