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A. MARKOWICH

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GRAIN DRYER

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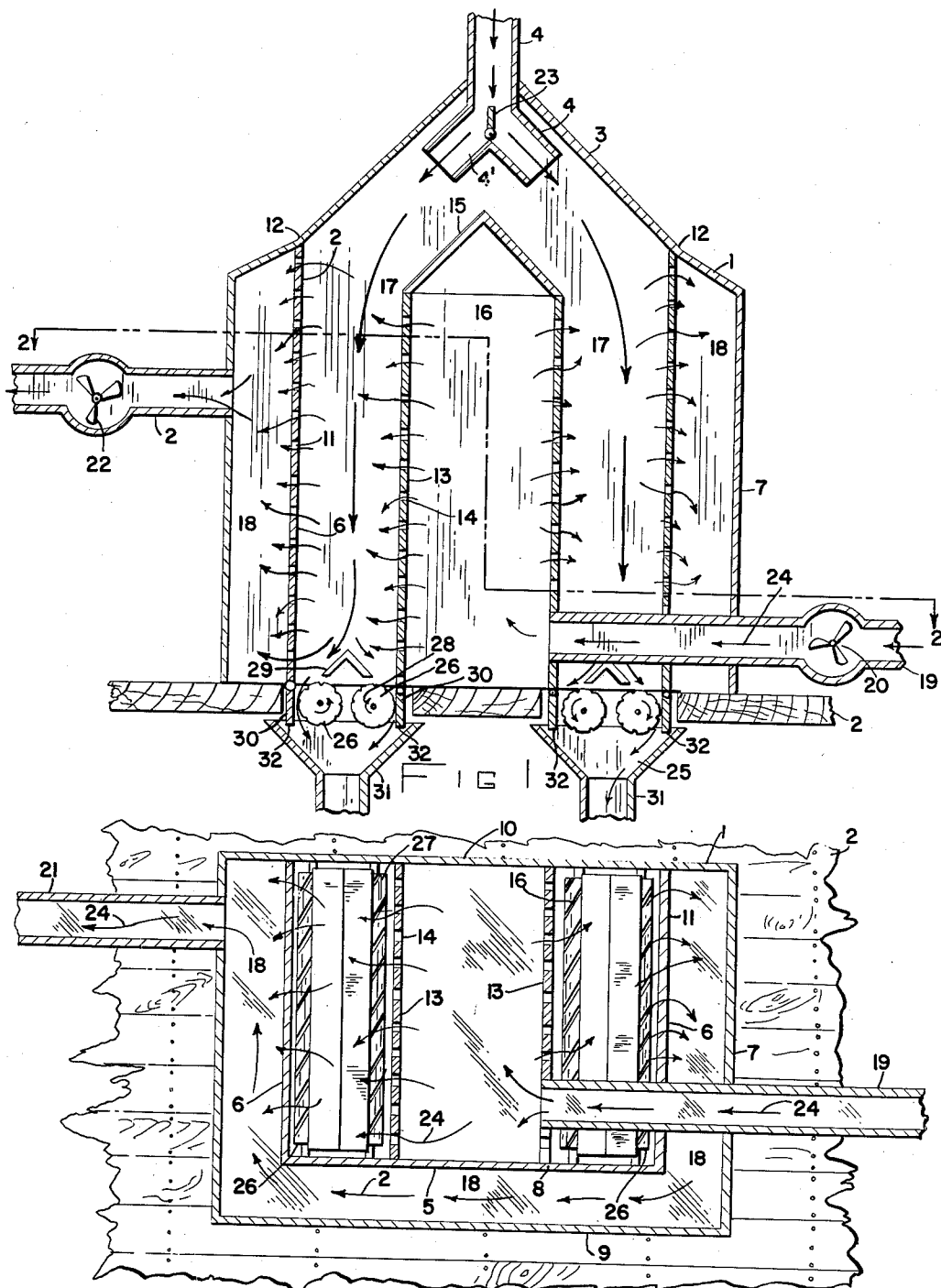


FIG 2

Inventor
Andrew Markowich
By *Arthur L. Stoughton*
HIS ATTYS

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GRAIN DRYER

Andrew Markowich, Clairmont, Alberta, Canada

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1 Claim. (Cl. 34-174)

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My invention relates to new and useful improvements in grain drying devices, an object of my invention being to provide a device of the character herewithin described whereby grain can be passed through the device continuously and dried during its passage therethrough.

A further object of my invention is to provide a device of the character herewithin described whereby the speed of grain passing through the device can be controlled accurately thereby enabling the amount of moisture being removed from the grain, to be controlled.

Still another object of my invention is to provide a device of the character herewithin described wherein the warm air used in drying passes to the centre of the device and then outwardly through the grain mass to be collected in an exhaust manifold, both the exhaust manifold and the intake being provided with separate air moving devices thereby ensuring continuous flow of air through the machine.

Yet another object of my invention is to provide a device of the character herewithin described which has been designed specifically for farm use and is extremely simple in construction, economical in operation, and otherwise well suited to the purpose for which it is designed.

With the foregoing objects in view, and such other objects and advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, my invention consists essentially in the arrangement and construction of parts all as hereinafter more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a side sectional elevation of my device.

Figure 2 is a horizontal section of my device substantially along the lines 2-2 of Figure 1.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Due to the relatively high cost of conventional commercial grain drying apparatus, it is normally not possible for the average farmer to possess equipment for the drying of grain. Consequently I have designed a grain dryer of high efficiency yet relatively low cost and which furthermore operates extremely economically. This dryer, hereinafter to be described, is particularly suitable for individual farmers as well as for elevator operators and the like.

Proceeding now to describe my invention in detail, it will be seen from the accompanying drawings that I have provided a substantially rectangular outer casing 1 supported upon a platform 2. This outer casing is provided with a conical roof 3 through the apex of which extends a grain intake conduit 4.

Situated within the outer casing 1 is a rectangular inner casing 5 and it will be seen from a perusal of Figure 2 that this inner casing comprises a pair of end walls 6 parallel with the end walls 7 of the outer casing, and a front wall 8 parallel with and spaced from the front wall 9 of the outer casing. In other words, the rear wall 10 of the outer casing is common to both casings. It will also be observed that the end walls 6 are perforated as at 11 and

that they extend from the platform 2 to the roof 3 of the outer casing being joined thereto as indicated at 12.

Within this inner casing I have provided a pair of vertical partitions 13 also perforated as at 14 and situated parallel to the end walls 6 and extending between the rear wall 10 and the front wall 5. These partitions do not extend upwardly the full height of the outer casing but terminate in an inverted V cap 15 which thus seals off the space 16 between the partitions. These partitions together with the cap 15 constitute what I define as a central air distributor column bearing the reference character 16 and having perforated walls as hereinbefore described.

The areas 17 bounded by the partitions 13 and the end walls 6 of the inner casing form what I defined as vertical grain channels upon each side of the column 16 and these vertical channels are open at the upper ends thereof and communicate with the interior of the roof 3 of the outer casing. The areas 18 between the end walls 6 of the inner casing, the end walls 7 of the outer casing, and the front walls 8 and 9 of the casings form a communicating passageway which acts as an air exhaust manifold and bears the reference character 18.

An air intake duct 19 extends from the exterior of the device inwardly through the outer casing to the aforementioned air distributor column 16 and is provided with a fan 20 and means to heat the air passing therethrough (not illustrated). Also associated with the air heating means are suitable control valves of a conventional nature (also not illustrated).

An air exhaust duct 21 having a fan 22 therein communicates with the aforementioned manifold 18 and discharges air therefrom to the atmosphere.

The aforementioned grain intake duct 4 diverges into the two ducts 4' and 4'' so that grain passing therethrough can be directed into each of the grain channels 17 and a control flap 23 enables the operator to control the quantity of grain flowing to either channel.

From the foregoing it will be appreciated that grain can flow downwardly into the channels 17 and that warmed air enters the central column 16 in the direction of arrows 24 whereupon the air passes through the perforations 14, through the grain contained in the grain channels 17 and thence through the perforations 11 into the air exhaust manifold 18 whereupon it is exhausted through the duct 21 to the atmosphere carrying with it moisture picked up from the grain within the channels.

Grain discharge means collectively designated 25 are provided at the base of each of the grain channels 17, said means including a pair of rollers 26 mounted for rotation within the base of the channels, said rollers being parallel and provided with spiral striations 27 to facilitate the movement of grain thereby. Means are provided to rotate said rollers in the direction of arrows 28 but as said means are conventional they have not been illustrated in the drawings.

A longitudinally extending shroud 29 is situated above each pair of rollers 26, said shroud being of an inverted V configuration when viewed in section. These shrouds direct the grain passing downwardly within the channels 17, through the outside portions 30 of the said rollers and ensure that the grain exits from the channels adjacent the partitions 13 and the end walls 6 into collecting chutes 31 situated therebelow.

Means to control the volume of grain passed by the rollers is provided and takes the form of flaps 32 hinged depending from the lower edges of the partition 13 and the end wall 6. Conventional screw threaded rods 33 engageable within brackets 34 provide means whereby the position of the flaps from the vertical may be controlled thereby controlling the gap between the flaps and the perimeter of the rollers so that the speed at which the grain is discharged can be controlled. In other words

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the speed with which the grain passes through my dryer is controlled solely by these flaps 32 in conjunction with the rollers 26.

In operation, grain is fed through the duct 4 and passes downwardly through the vertical grain channels 17 at a speed determined by the percentage moisture there-within. Hot air is passed through duct 24 and into the central air distributor column 16 whereupon it passes through the grain within the channels 17 and is thence exhausted as hereinbefore described.

In conclusion I wish to stress the ease with which my device is controlled to suit all conditions as both the speed of grain passing therethrough and also the volume and temperature there utilized may readily be controlled.

Since various modifications can be made in my invention as hereinabove described, and many apparently widely different embodiments of same made within the spirit and scope of the claim without departing from such spirit and scope, it is intended that all matter contained in the accompanying specification shall be interpreted as illustrative only and not in a limiting sense.

What I claim as my invention is:

A device for removing moisture from grain or the like comprising in combination a substantially rectangular, vertical outer casing, an inner casing spaced from three of the walls of said outer casing the fourth wall of said outer casing being common to both casings, and a pair of vertical perforate partitions within said inner casing

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and parallel with the end walls thereof, said partitions constituting a central air distributor column being closed at both ends thereof, said partitions and said end walls constituting vertical grain channels on each side of said column, said end walls also being perforate, said end walls and the end walls of said outer casing constituting an air discharge manifold, an air intake duct communicating with the interior of said column, and an air exhaust duct communicating with the interior of said manifold, grain intake means situated at the upper end of said outer casing, and grain discharge means situated at the base of each of said grain channels, and means associated with the bases of said channels to control the volume of grain discharging therefrom, said grain intake means comprising a substantially vertical duct extending through the upper side of said outer casing and substantially in the centre thereof, the lower end of said duct being of an inverted Y configuration, and baffle means within said duct to control the direction of flow of grain therethrough.

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