J. E. J. GOODLETT.

MACHINE FOR IMPREGNATING STOCK FOODS.

APPLICATION FILED OCT. 28, 1909.

**981,549.** **Patented Jan. 10, 1911.**

2 SHEETS—SHEET 1.

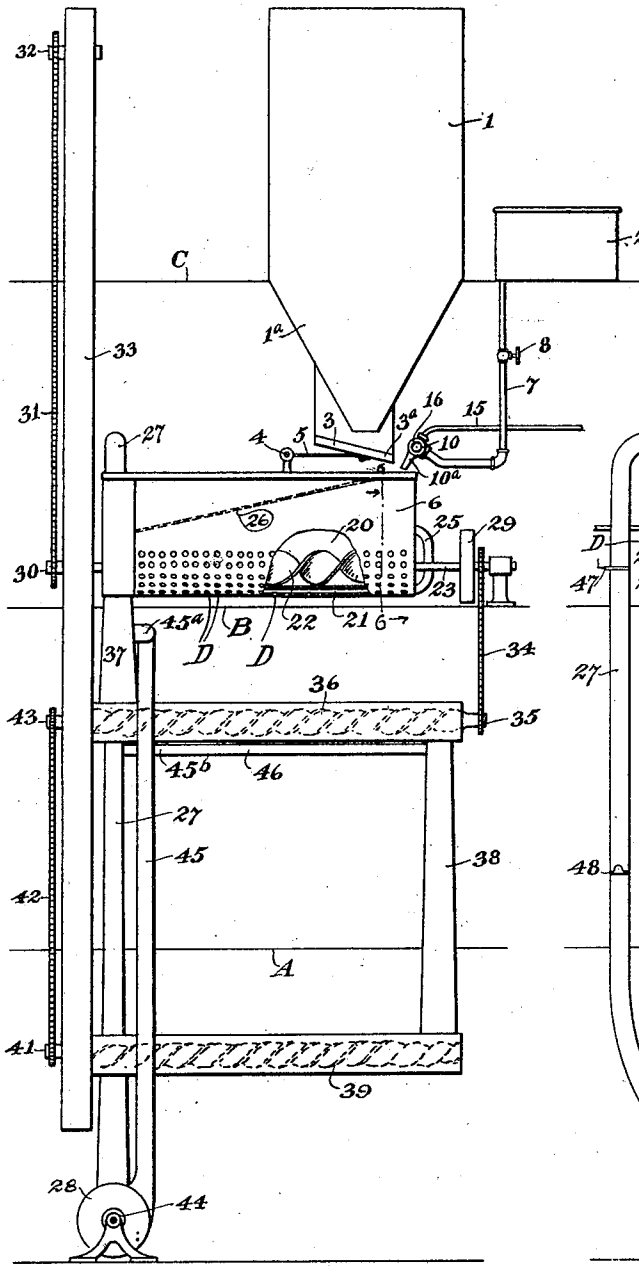



Fig. 1

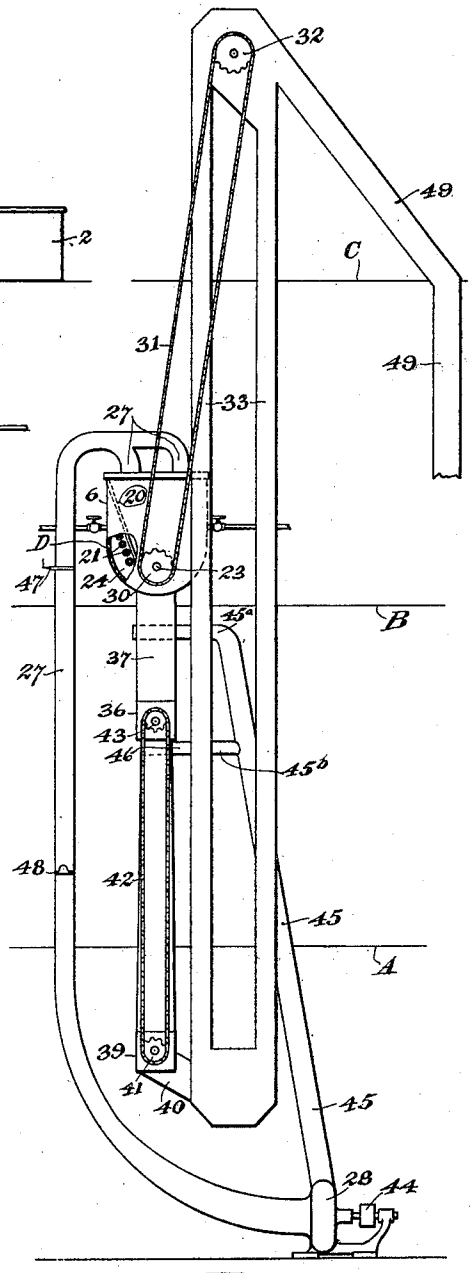



Fig. 2

Witnesses:
H. C. Talcutine
A. C. Otters

Inventor:
Joseph E. J. Goodlett
by Fred B. Dillman
Attorney.

J. E. J. GOODLETT.

MACHINE FOR IMPREGNATING STOCK FOODS.

APPLICATION FILED OCT. 28, 1909.

**981,549.** Patented Jan. 10, 1911.

2 SHEETS—SHEET 2.

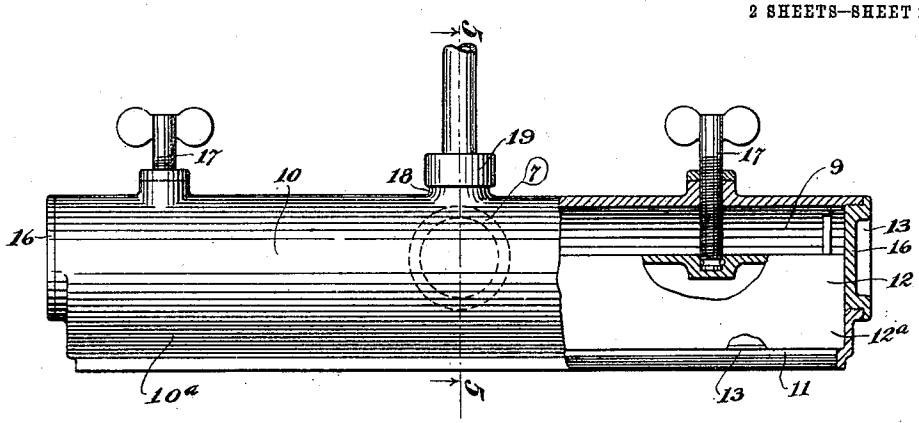



Fig. 3

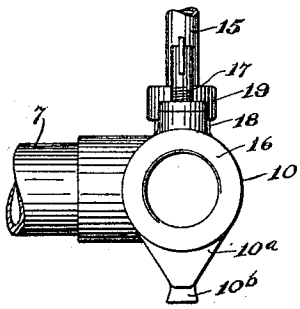



Fig. 4

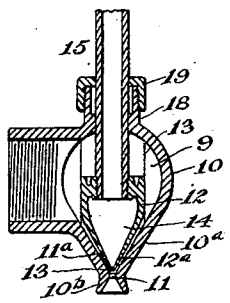
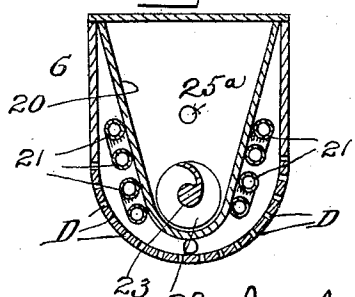



Fig. 5

Fig. 6.




Witnesses:
H. C. Valentine
A. C. Otters

Inventor:
Joseph E. J. Goodlett
By Obed B. Dillman
Attorney.

# UNITED STATES PATENT OFFICE.

JOSEPH E. J. GOODLETT, OF MEMPHIS, TENNESSEE.

## MACHINE FOR IMPREGNATING STOCK FOODS.

981,549. Specification of Letters Patent. **Patented Jan. 10, 1911.**

Application filed October 28, 1909. Serial No. 525,021.

*To all whom it may concern:*

Be it known that I, JOSEPH E. J. GOODLETT, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Machines for Impregnating Stock Foods, of which the following is a specification.

My invention relates to improvements in machines for impregnating stock-foods with molasses, the primary object of the invention being to provide a generally improved machine or apparatus for this purpose of simple, cheap, and efficient construction adapted to thoroughly atomize hot molasses and mix or incorporate the same with stock-food, such for example, as alfalfa, corn, oats and other grains.

The invention relates more particularly to an improved atomizing nozzle adapted to atomize the hot molasses as received from the boiling kettle by means of compressed air and distribute and project the atomized molasses into a stream of falling stock-food as the latter passes from the storage tank into the mixer of the improved apparatus.

The process of treating stock-foods herein described but not claimed, is made the subject matter of a divisional application, filed November 30, 1910, Serial No. 594,995.

With the above mentioned ends in view, the invention consists in the novel construction, arrangement, and combination of parts, hereinafter described, illustrated in one of its embodiments in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings forming a part of this specification, Figure 1, is a front elevation of a machine or apparatus constructed in accordance with this invention. Fig. 2, an end or side elevation of the same. Fig. 3, an enlarged detailed top plan view of the improved atomizing nozzle, a portion of its walls being broken away for the purpose of clearer illustration of the parts. Fig. 4, an end view of the same. Fig. 5, a cross sectional view of the same taken through line 5—5 of Fig. 3. Fig. 6, a cross-sectional view of the mixer taken through line 6—6 of Fig. 1.

Similar numerals of reference designate like parts throughout all the figures of the drawings.

The improved machine or apparatus, in its present embodiment, comprises a storage bin 1, into which the stock-food to be treated is first placed, and a molasses heating kettle or tank 2, to receive the molasses to be heated and atomized as hereinafter described. The storage bin 1, is provided with a depending hopper portion $1^a$, provided at its lower end with an inclined shaker board or plate 3, adapted, when the machinery is started, to be reciprocated by means of an eccentric shaft 4, and connecting rod 5. When the machinery is in operation the shaker plate 3, is adapted to distribute and feed the stock-food in a thin longitudinally extending stream along the edge $3^a$, of the plate where it falls into one end of the mixer 6, to be heated and conveyed as hereinafter described.

After the molasses has been properly heated in the kettle or tank 2, and the machinery started, it is conducted through the conduit pipe 7, by opening the valve 8, and the hot molasses is permitted to enter the longitudinally extending chamber 9, of the valve body 10, carried upon the end of the conduit pipe 7. The valve body 10, extends horizontally the full width of the adjacent end of the mixer 6, and is provided with a longitudinally extending nozzle portion $10^a$, adjacent to the falling stream of food to be treated, and said nozzle portion is adapted to distribute and project the atomized molasses into the falling stream of stock-food or feed.

The character and quantity of the atomized stream of molasses passing out of the longitudinal slot 11, of the nipple portion $10^b$, is controlled and regulated by means of a longitudinally extending hollow wedge shaped or tapered movable valve 12, mounted in ways 13, within the valve body 10, said movable valve having its tapered portion $12^a$, adapted to be seated within the longitudinal recess or channel portion $11^a$, of the valve body. The movable valve 12, is provided with a longitudinal slot 13, at the apex of its tapered portion $12^a$; said slot registering with and being adjacent to the longitudinal slot 11, in the nozzle portion of the valve body and communicating with a longitudinally extending air chamber 14, within the movable valve. The movable valve 12, is provided at its rear with an air inlet pipe-stem 15, extending through and slidably mounted in the rear portion of the valve body. The air inlet pipe or stem 15, is connected to a suitable air pipe or hose

communicating with a suitable air compressor adapted to force compressed air into air chamber 14, and out through the longitudinal slot 13, whereby the hot molasses in passing out through the longitudinal slot 11, of the nozzle portion of the valve body will be thoroughly atomized and projected into the adjacent falling stream of stock-food.

The valve body 10 is provided at its ends with threaded openings through which the movable valve 12, may be inserted or removed, said thread openings being closed by means of threaded plugs 16. The movable valve 12 is adapted to be moved or shifted to and from its open or closed positions by means of threaded thumb bolts 17, extending rearwardly and mounted in suitable threaded openings in the rear portion of the valve body as shown. The slidably mounted air inlet pipe 15, preferably extends through an exteriorly threaded boss 18, adapted to contain a packing-gland retained in position by means of a packing nut 19.

The mixer 6, contains a V-shaped trough 20, surrounded by a series of steam heating pipes 21. The stock-food after being subjected to the spray of molasses and after falling into the end of the mixer, is carried along in the V-shaped trough by means of a screw conveyer 22, mounted on a driving shaft 23. The stock-food as carried along in the trough 20, is heated from the steam pipes 21, and the heat generated in the chamber 24, intermediate the trough 20, and the walls of the mixer 6, is adapted to communicate with the receiving end of conveyer trough 20, in the present instance, by means of a conduit pipe 25 having its end $25^a$, intersecting the front wall of the mixer, as shown most clearly in Fig. 6, of the drawings. An apron 26, is preferably formed in the trough 20, above the screw conveyer 22, and the hot air is drawn from the receiving end of the mixer through the stream of falling feed toward the discharge end of the mixer by means of a suction trunk 27, communicating with a suction or blower fan in the fan casing 28. The cold air passes into the mixer 6, through the air inlet openings D, and is then heated by passing over and about the steam pipes 21, where it is heated and utilized as above described. One end of the shaft 23, is provided with a driving pulley 29, adapted to carry a belting communicating with a suitable source of power and the other end of the driving shaft is provided with a sprocket wheel 30, carrying a sprocket chain 31, passing over a second sprocket wheel 32, above, which latter operates a suitable elevator chain or belt in the vertically arranged elevator boots 33. The shaft 23 is provided with a second sprocket wheel adjacent the driving pulley 29, carrying a second sprocket chain 34, passing over a sprocket wheel 35, below. The sprocket wheel 35, drives a second screw conveyer located in a conveyer box 36. The receiving end of the conveyer box 36, is provided with a vertical feed box or spout 37, which receives the feed from the discharge end of the mixer 6, above. The feed as received at the receiving end of the conveyer box 36, is carried by the screw conveyer to the opposite end of the conveyer box where it is discharged and falls through a vertical spout or box 38, into the receiving end of a second conveyer box 39. The feed as discharged in this conveyer box is conveyed by a screw conveyer similar to those above described and the opposite end of the conveyer box 39, where it is discharged through a discharge spout 40, intersecting the lower ends of the elevator boots 33. The screw conveyer in the conveyer box 39, is operated by a sprocket wheel 41, carrying a sprocket chain 42, passing over a sprocket wheel 43, on the end of the screw conveyer in the conveyer box above.

The fan in the fan casing 28, is adapted to be driven by a pulley 44, and to discharge cold air through an upwardly extending air discharge pipe 45. Said air discharge pipe terminating at its upper end in outlet branches $45^a$ and $45^b$. The upper branch $45^a$, intersecting the spout 37 and discharging cold air therein. The lower outlet branch $45^b$, intersects a cold air conduit 46, extending along the spout or box 36, and intersecting the upper end of the discharge spout or box 38.

The suction of the air in the suction trunk 27, may be regulated by means of a suction regulator slide valve 47, at the upper end of the suction trunk and a small cold air inlet opening 48, is provided below to admit a certain amount of cold air into the suction trunk 27, to mix with the warm air therein and carried to the fan in the fan casing below. The finished feed after being carried to the head of the elevator boots 33, above is discharged through the discharge pipe 49, leading to the sacker. The floor lines are indicated by the lines A. B. and C. The eccentric shaft 4 is suitably connected by means of any suitable and convenient gearing or driving mechanism to the driving shaft 23, carrying the main driving pulley 29.

As the stock-food is fed in a thin longitudinally extending stream along the edge $3^a$, of the inclined shaker-board 3, and falls into the end of the mixer 6, it is impregnated with hot atomized molasses projected into the falling stream by means of the longitudinally extending atomizing nozzle portion $10^a$, of the valve body 10. A hot-air blast passes through the falling stream of stock-food from the conduit pipe 25, and

the stock-food in the mixer 6, is further heated by the passage of said hot-air over the stock-food and the heating of the walls of the V-shaped trough 20, by means of the steam heating pipes 21. When the stock-food reaches the discharge end of the mixer 6, it is discharged vertically through a vertical spout 37, into the receiving end of a conveyer-box 36, below, and as the food falls through the spout 37, it is cooled to a certain degree by means of a cold air blast passing out of the branch 45ª, of the cold air discharge pipe 45, leading from the fan casing 28.

The stock-food is conveyed to the opposite end of the conveyer-box 36, by means of a second screw conveyer, and when it reaches the opposite or discharge end of the conveyer-box 36, it falls vertically through the vertical spout 38, where it is further cooled by a second cold air blast passing out of the intersecting cold air conduit 46, extending along the conveyer box 36. By the time the stock-food has reached the receiving end of the conveyer-box 39, it has been sufficiently cooled and is conveyed through the conveyer-box by means of a third screw conveyer which discharges the stock-food into the intersecting lower ends of the elevator-boots 33.

From the foregoing description taken in connection with the accompanying drawings, the operation and advantages of my invention will be readily understood.

Having thus described an embodiment of my invention, what I claim and desire to secure by Letters Patent is,—

1. In a machine of the character described, a double walled mixer provided with an intermediate heating chamber, a food discharge hopper discharging into said mixer, a valve projecting hot atomized molasses into the discharging stream of food, heating pipes disposed in said heating chamber, and means for conveying hot air from said heating chamber through and over said food while in said mixer.

2. In a machine of the character described, a mixer, a discharge hopper discharging the food into said mixer, an atomizing valve projecting atomized molasses into said food as discharged into said mixer, means for heating said food as conveyed in said mixer, and means for conveying hot air through and over said food as discharged into and conveyed through said mixer.

3. In a machine of the character described, a mixer, means for discharging food therein, means for atomizing and projecting molasses into the discharging stream of food, means for heating the adjacent air and said food as conveyed in said mixer, means for conveying said heated air over said food as conveyed in said mixer, and means for gradually cooling and conveying said food from said mixer.

4. In a machine of the character described, a mixer, a food discharge hopper discharging the food in a thin horizontally extending stream into said mixer, a horizontally extending atomizing valve extending in front of said discharging stream of food and adapted to atomize and project molasses into said discharging stream of food, means for heating the food and adjacent air in said mixer, and means for conveying said heated air over and through said food while in said mixer.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOSEPH E. J. GOODLETT.

Witnesses:
C. W. DAVIS,
LANG MCCORMICK.