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MOLASSES PRODUCT AND METHOD OF MAKING THE SAME

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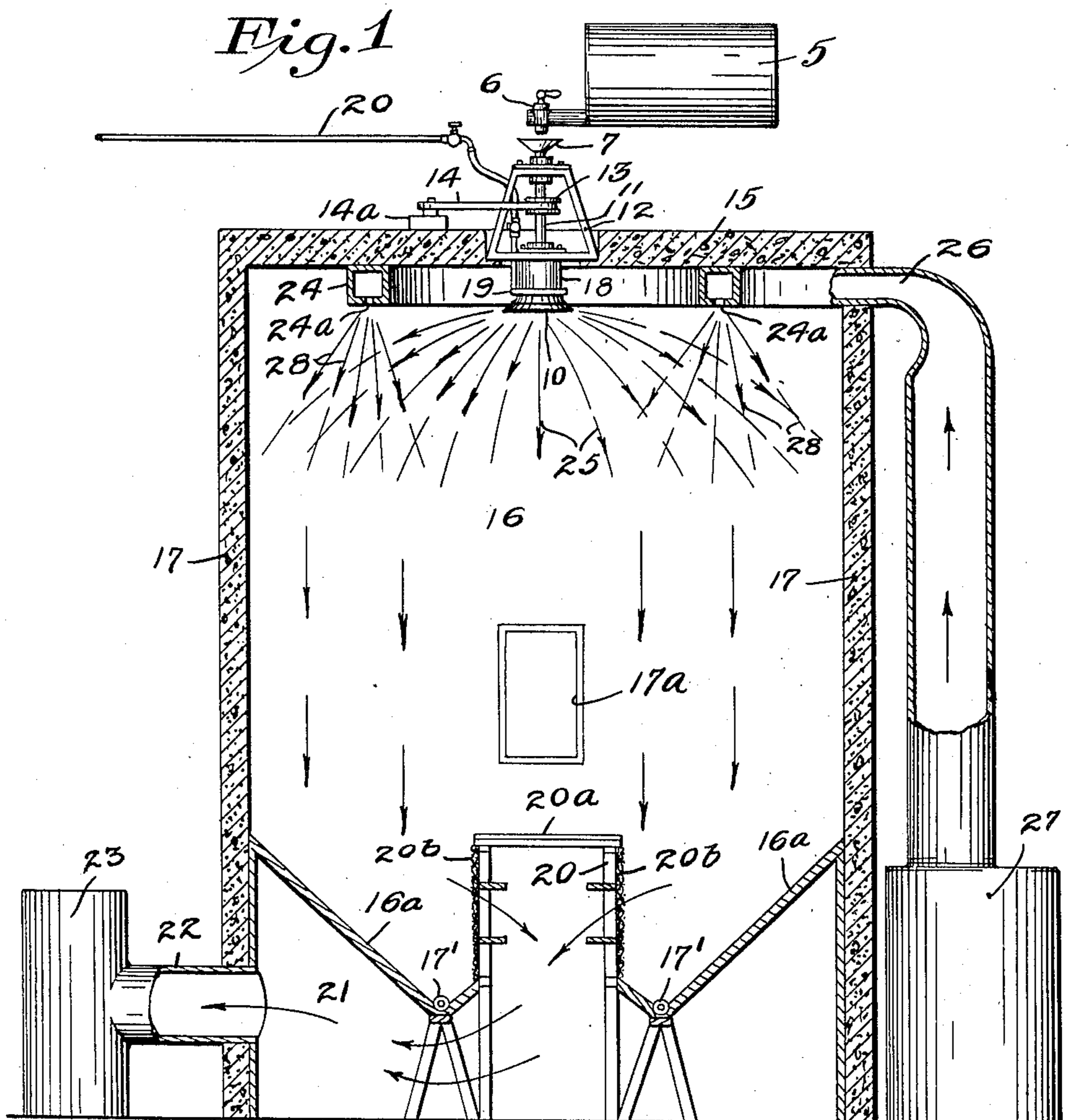


Fig. 2

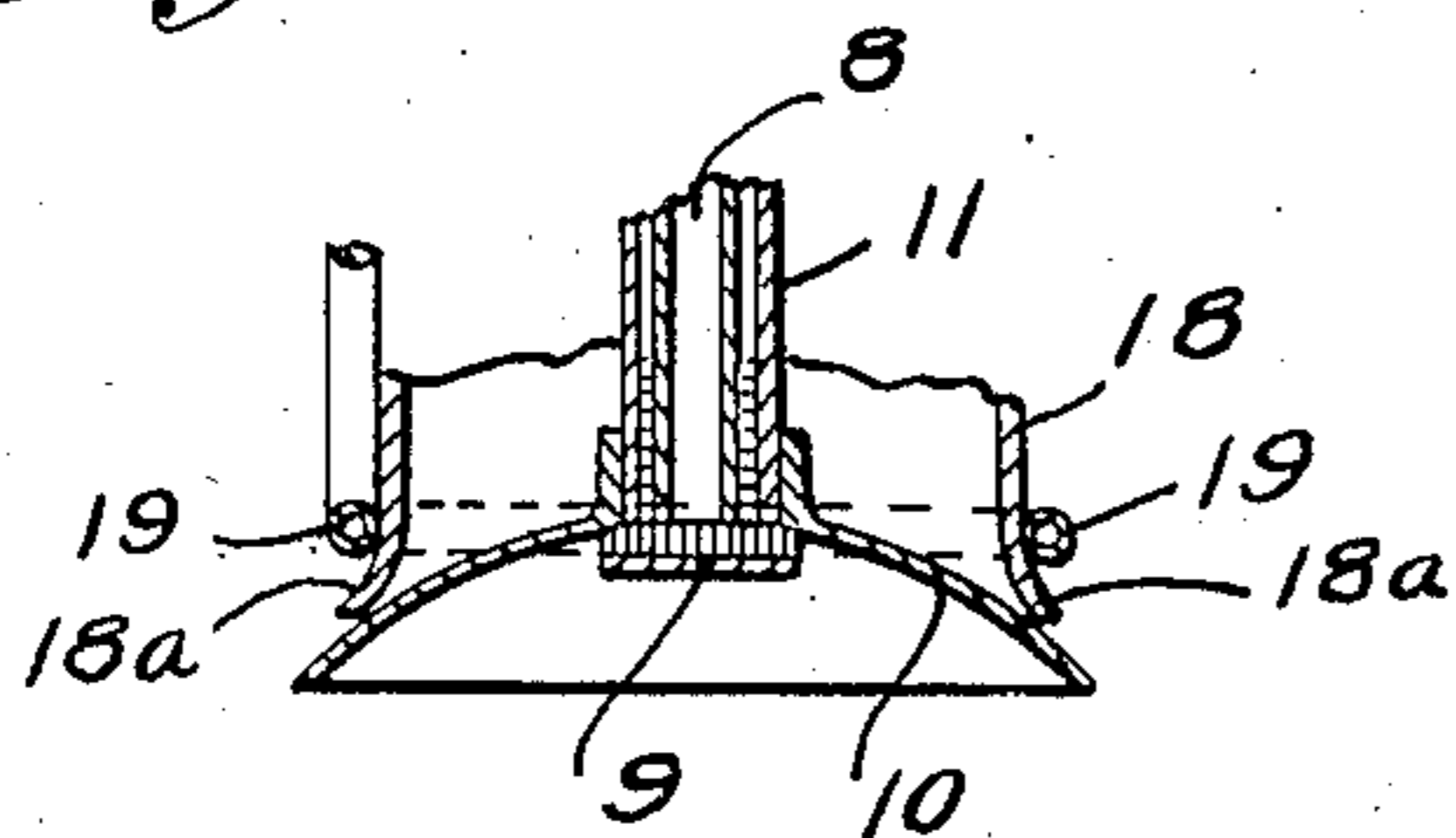
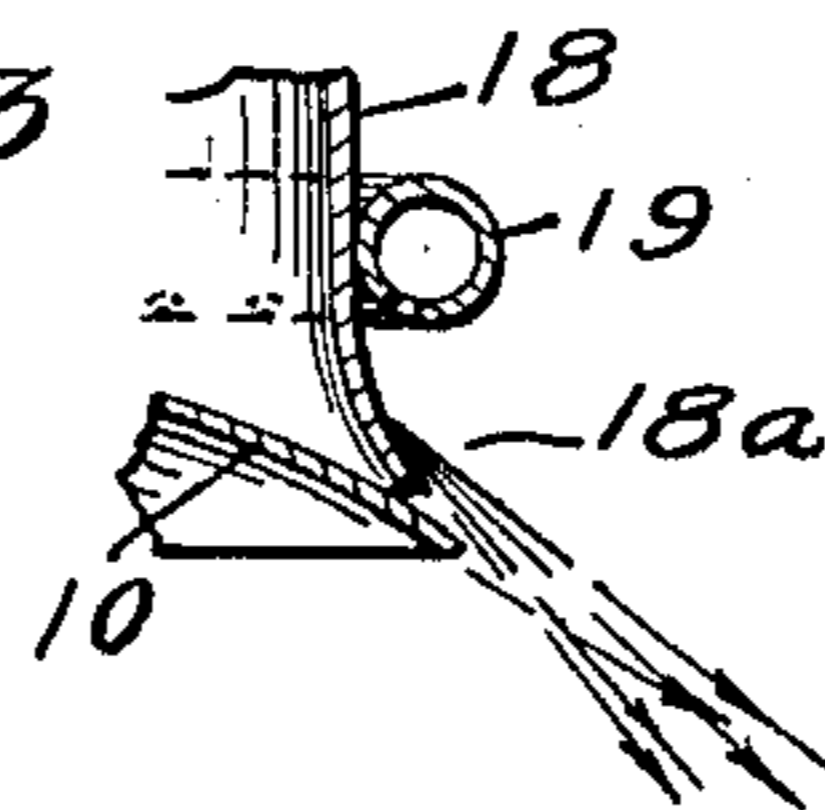


Fig. 3



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MOLASSES PRODUCT AND METHOD OF MAKING THE SAME

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This invention relates to a process of drying a fluid or semi-fluid material, and particularly to a process of drying molasses. Molasses, especially the cheaper and coarser forms, such as cane and sorghum molasses, are now used in animal feeds, particularly the mixed rationed feeds. One form of this molasses is commonly known as "Black Strap." It is desirable for the purpose of mixing, to have the molasses in dry and powdered form.

It is an object of this invention, therefore, to provide a simple and efficient means for producing a dry or powdered form of molasses.

It is another object of the invention to provide a process of producing a dried product consisting of molasses, mixed with various ground cereals or other feeds.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views and in which:—

Fig. 1 shows a drying cabinet, the same being largely in central vertical section;

Fig. 2 is a partial central vertical section through the distributing apparatus; and

Fig. 3 is a view similar to Fig. 2, shown on an enlarged scale.

It is an object of the invention to provide a dried product containing molasses, which may also contain other materials. If the materials are to be mixed with molasses before the same is dried, the molasses and ground materials such as wheat, corn or other grain or ground alfalfa meal, are mixed together by being stirred in any suitable apparatus. The molasses mixture is then delivered to a drying apparatus. The present process contemplates the drying of the material by spraying and disintegrating the same by mechanical or other means in

a shower in a drying chamber, and passing heated air through said shower to substantially instantaneously dry the projected material. One form of apparatus suitable for carrying out the process is illustrated in the drawing. The material which will be in a fluid or semi-fluid condition is contained in a tank 5. While the material may be treated cold or at ordinary temperatures, it preferably will be kept comparatively warm or hot so as to be more liquid. The material passes from the container 5 through the valve equipped discharge spout 6 into the funnel 7 through which it passes into a pipe 8. The pipe 8 discharges at its bottom onto a plate 9 which is carried on the under side of the dome-like or semi-spherical head 10. This head is secured to and carried on the lower end of a rotary spindle 11 disposed in suitable bearings carried in the frame 12, which spindle has the grooved pulley 13 secured thereto adapted to be rotated at high speed by means of a belt 14 connected to a suitable motor 14a. While the motor and belt have been successful in driving the centrifugal discharge head, the same may also be driven by a steam turbine secured to the rotating spindle 11. The frame 8 is secured in and partly disposed in the top 15 of a chamber 16 having the side walls 17, and while the chamber may be of various forms, it preferably is cylindrical. A deflecting member 18 is provided, of cylindrical form, having an outwardly flared lower portion 18a disposed above the member 10 and adjacent to and somewhat within the lower edge thereof. A pipe or conduit 19 surrounds the member 18 adjacent its lower edge and is connected by a valve equipped pipe 20 with a suitable source of steam supply. The steam supplied by the pipe 20 is preferably at a high temperature, or superheated. The pipe 19 has a multiplicity of downwardly directed openings therein.

The chamber 16 has a bottom formed as V-shaped troughs 16a at its bottom, which preferably will be equipped with suitable rotary discharge conveyors 17' of the screw or helical type. A central member 20 shown as having an imperforate top 20a and screened or perforate side walls 20b, is provided centrally of the chamber, which, with the troughs 16a, forms a lower chamber 21. An outlet conduit 22 extends through the walls 17 in the chamber 21 and will be connected with some suitable suction device contained in the casing 23. The walls 17 are provided with removable panels 17a by which the chamber 16 may be inspected or entered. A conduit 24 extends around the top of chamber 16 at the sides of and some distance from the member 18, said conduit having a multiplicity of openings 24a in its bottom. The conduit 24 communicates with a conduit 26 extending through the walls 17 which will extend to some suitable means for delivering air under pressure such as a blower housed in the casing 27.

In carrying out the process, the material discharged onto the plate 9 is thrown therefrom outwardly against the under side of the member 10 and will be thrown out centrifugally from the edge of said member as indicated by the arrows 25 in Fig. 1, so that the same passes downwardly in an umbrella-like shower. The steam is supplied under considerable pressure through the pipe 20 and this steam issues from the openings in pipe 19 as indicated in Figs. 2 and 3 and meets the particles projected from the disk 10 immediately adjacent the edge of said disk. This steam acts by impact on the particles and finely disintegrates the same so that the material is broken up into exceedingly fine particles. As the shower passes outwardly from member 10, heated air is supplied through conduit 24, passes downwardly through the same, and comes in contact with the particles, quickly drying the same. The material will be partly dried by the temperature of the steam from pipe 19 and the drying is completed by the heated air supplied through the conduit 24. The finely divided and dried particles drop through the cabinet or chamber 16 into the troughs 16a. The air delivered to the cabinet passes through the foraminous walls 20b into the chamber 21 and out through the conduit 22. As stated, the air supplied through conduit 26 is first heated to a considerable temperature. The dried molasses material collects in the troughs 16a and is allowed to remain there until quite an accumulation occurs. The particles while dried by passing downward in chamber 16 with the air, collect in a mass. The molasses material is quite hygroscopic and the particles tend to stick together. When a mass has collected in the cabinet, the supply of

hot air is discontinued and cold air is passed into the cabinet through the conduit 26. The temperature is thus lowered in the cabinet and brought to quite a low point, somewhat above freezing. This cooling prevents the dried particles from sticking together and the same can be handled as a dried powder. This powder is then removed from the troughs 16a and placed in suitable containers and sealed against the entrance of air. As long as the dried molasses or dried molasses material is kept at a comparatively low temperature it will remain in the form of a powder and can be easily and conveniently mixed with the feed. After the molasses has been mixed with the ground cereal or other ground feed such as alfalfa meal, it does not absorb moisture so quickly as does the dried molasses alone. The dried mixture of the molasses and other ground feed can be easily handled and is in very convenient condition to be mixed with the other constituents of rationed feeds when the same are prepared in the usual mixing apparatus.

From the above description it is seen that applicant has provided a very simple and efficient process for drying molasses or molasses material. The dried product is very conveniently handled and transported, and much more conveniently mixed in the rationed feeds than is the liquid molasses. The volume is, of course, much smaller, and transportation costs and space are saved. The process has been amply demonstrated in actual practice and found to be very successful.

It will, of course, be understood that various changes may be made in the steps and sequence of steps in the process and in the constituents and proportions of the product without departing from the scope of applicant's invention which, generally stated, consists in the process and product disclosed and defined in the appended claims.

What is claimed is:—

1. The process of producing a dried molasses material which consists in mixing liquid molasses with ground alfalfa meal, spraying and disintegrating said mixture in a drying chamber to form a shower, and passing heated air through said shower to quickly dry the material.

2. The process of producing a dried molasses and feed material which consists in mixing the liquid molasses with a finely ground vegetable feed material, projecting said mixture to finely divide the same and spraying the same in a shower in a drying chamber and passing heated air through said shower to quickly dry said material to form a fine dry powdered material.

3. The process of producing a molasses product for a stock food which consists in mixing molasses with a ground cereal meal

to form a liquid or semi-liquid mixture, projecting and disintegrating said mixture in a hot drying medium to dry the same and form a dry powdered material.

- 5 4. The process of producing a molasses product for a stock food which consists in mixing molasses with alfalfa meal to form a liquid or semi-liquid mixture, projecting said mixture in the presence of a hot gaseous
10 medium to disintegrate and dry the same to form a dry finely divided material.

In testimony whereof I affix my signature.

JOHN C. MacLACHLAN.

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