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COMBINED CONGEALER AND SIZER

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My invention relates to a combined congealer and sizer, and the objects of my invention are: first, to provide an apparatus for congealing liquids, more particularly agar; second, to provide a congealing apparatus of this class which sizes the material as it leaves the congealer; third, to provide a novelly constructed and arranged congealer and sizer for agar and the like; fourth, to provide a congealer which is almost instantaneous in its action; fifth, to provide a means for making congealed material in short cylindrical portions; sixth, to provide a novelly constructed congealer and sizer, and seventh, to provide a combined congealer and sizer of this class which is very simple and economical of construction, durable, efficient in its action, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Figure 1 is a longitudinal sectional view of the congealer and sizer, showing some of the parts in elevation to facilitate the illustration; Fig. 2 is an end view of the operating mechanism and congealer and sizer from the line 2—2 of Fig. 1; Fig. 3 is a sectional view on an enlarged scale through 3—3 of Fig. 1; Fig. 4 is an end view on an enlarged scale from the line 4—4 of Fig. 1, showing a portion broken away and in section to facilitate the illustration, and Fig. 5 is a top or plan view of the outlet end of the congealer and sizer from the line 5—5 of Fig. 1.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

The cylindrical casing 1, spout 2, face plates 3 and 4, tubes 5, knife 6, support 7, shaft 8, valve member 9, head member 10, revolving packing 11, stuffing box gland 12, material inlet 13, pressure gage 14, water inlet 15, water outlet 16, thermometer 17, main driveshaft 18, gearing support 19, bearings 20 and 21, gear 22, pinion 23, and drive pulley

24, constitute the principal parts and portions of my combined congealer and sizer.

The casing 1 is a hollow cylindrical casing threaded externally at its head end and adapted to fit into the threaded portion of the head member 10. Around its opposite end is a clamp band 1^a, which is a band of circular form adapted to fit around the end and provided with extended loop portions 1^b and 1^c through which a bolt 1^d extends. This clamp band 1^a is for the purpose of securing the spout 2 in position relative to the cylinder 1, the spout being provided with an angular flange portion 2^a, which fits in between the band and the end of the cylinder 1, thus providing means for securely clamping the spout member 2 at the outlet end of the cylinder 1. This cylinder 1 is internally threaded at its opposite end, into which are screwed the face plates 3 and 4. Rigidly secured in these face plates 3 and 4 is a plurality of tubes 5, as shown best in Figs. 1, 3 and 4 of the drawings. Mounted centrally in the casing 1 is a shaft 8, which extends longitudinally there-through, and at the outlet end extends some distance beyond the face plate 4. Secured on this shaft is a support member 7, which is provided with a tension spring 7^a and with ball-bearings 7^b tending to hold said support against the end of the face plate and revolving with the shaft 8. Secured on this support 7 is a knife member 6, which extends outwardly to pass the outer row of tubes in the base plate 4. This knife 6 is provided with a hub portion 6^a, which is rigidly secured on the support 7. The shaft 8 is secured in the end of the main shaft 18, and the main shaft 18 extends into the base plate 3 and is journaled thereon. Mounted against the end of the base plate 3 on the outer side is a disc provided with a slot 9^a extending from near its middle to near its periphery, as shown best in Fig. 3 of the drawings, thus providing a valve over the ends of the tubes 5. This valve 9 is secured to the shaft 18 by means of a key 9^b so that the valve 9 revolves with the shafts 18 and 8, so that the slot 9^a passes over the ends of the tubes 5, the casing 1, base plate 3, and head 10 being stationary. The valve 9 is provided with an extended hub portion 9^b, which is threaded externally and upon which is mounted a packing member 11, which extends outwardly and

is adapted to revolve in the head 10. Between this packing member 11 and the head 10 is provided a packing 12^a supported by the packing gland 12. Mounted in the upper side of the head is the material to be congealed inlet 13, which is provided with a pressure gage 14 for determining the amount of pressure the material is under in its passage to the congealer. The casing 1 is provided with a cold water inlet 15 near its outlet end and with a water outlet 16 toward its head end, thus providing for circulating the cold water around the tubes 5. The shaft 18 is provided with a clutch 18^a of any conventional form. Around the shaft 8 is a spur gear 22, which meshes with the spur pinion 23 mounted on a secondary shaft 24^a on which is mounted a driven pulley 24 upon which is a belt connected with any power mechanism.

The operation of my apparatus is as follows:

The agar, or other substance to be congealed, is passed through the inlet conductor 13 into the head 10 between the valve 9 and the packing member 11 in a hot liquid state, the pressure being determined by the pressure gage 14 and the valve 9 revolving, the material passes through the slot 9^a into the tubes 5 and passes through the tubes, the cold water coming in through the tube 15 circulating around among the tubes and out through the outlet 16. The material is immediately congealed in the tubes and passes out under pressure at the outlet end. As it passes out the knife 6 cuts it off so that it is formed in a plurality of short, cylindrical portions and dropped down onto the spout 2, which conducts it from the apparatus, it being noted that the length of the cylindrical portions depends upon the pressure the material is under in its passage through the congealer.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention, the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing, means for admitting fluid to be congealed under pressure in the one ends of said tubes, and cutter means at the opposite ends of said tubes.

2. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing around said

tubes, and means for admitting fluid under pressure to be congealed in said tubes including a rotary member with an outwardly extending slot therein adapted to pass over the inlet ends of said tubes.

3. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing around said tubes, means for admitting fluid under pressure to be congealed in said tubes including a rotary member with an outwardly extending slot therein adapted to pass over the inlet ends of said tubes, and means for revolving said rotary member.

4. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing around said tubes, means for admitting fluid under pressure to be congealed in said tubes including a rotary member with an outwardly extending slot therein adapted to pass over the inlet ends of said tubes, means for revolving said rotary member, and packing means in connection with said rotary member.

5. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing around said tubes, means for admitting fluid under pressure to be congealed in said tubes including a rotary member with an outwardly extending slot therein adapted to pass over the inlet ends of said tubes, means for revolving said rotary member, a shaft in operative connection with said rotary member, and a knife secured in connection with said shaft adapted to pass over the outer ends of said tubes.

6. In an apparatus of the class described, a hollow casing, a plurality of tubes extending through said casing, means for circulating a cooling medium in said casing around said tubes, means for admitting fluid under pressure to be congealed in said tubes including a rotary member with an outwardly extending slot therein adapted to pass over the inlet ends of said tubes, means for revolving said rotary member, a shaft in operative connection with said rotary member, a knife secured in connection with said shaft adapted to pass over the outer ends of said tubes, and resilient means for supporting said knife relative to said tubes.

7. In an apparatus of the class described, a hollow cylindrical casing, a plurality of tubes extending longitudinally through said casing and through the end thereof, another casing over the end of said cylinder and encasing the ends of said tubes, and a valve rotatably mounted over the ends of said tubes in said second mentioned casing.

8. In an apparatus of the class described, a hollow cylindrical casing, a plurality of tubes extending longitudinally through said casing

and through the end thereof, another casing over the end of said cylinder and encasing the ends of said tubes, a valve rotatably mounted over the ends of said tubes in said second mentioned casing, and means for conducting fluid under pressure to be congealed into said second mentioned casing.

9. In an apparatus of the class described, a hollow cylindrical casing, a plurality of tubes extending longitudinally through said casing and through the end thereof, another casing over the end of said cylinder and encasing the ends of said tubes, a valve rotatably mounted over the ends of said tubes in said second mentioned casing, means for conducting fluid under pressure to be congealed into said second mentioned casing, and means for revolving said valve over the inlet ends of said tubes.

10. In an apparatus of the class described, a hollow cylindrical casing, a plurality of tubes extending longitudinally through said casing and through the end thereof, another casing over the end of said cylinder and encasing the ends of said tubes, a valve rotatably mounted over the ends of said tubes in said second men-

tioned casing, means for conducting fluid under pressure to be congealed into said second mentioned casing, means for revolving said valve over the inlet ends of said tubes, and a knife mounted over the outlet ends of said tubes cooperatively operated with said valve.

11. In an apparatus of the class described, a hollow cylindrical casing, a plurality of tubes extending longitudinally through said casing and through the end thereof, another casing over the end of said cylinder and encasing the ends of said tubes, a valve rotatably mounted over the ends of said tubes in said second mentioned casing, means for conducting fluid under pressure to be congealed into said second mentioned casing, means for revolving said valve over the inlet ends of said tubes, a knife mounted over the outlet ends of said tubes cooperatively operated with said valve, and resilient means for supporting said knife relative to its operating member.

In testimony whereof, I have hereunto set my hand at San Diego, California, this 27th day of November, 1926.

JOHN BECKER.