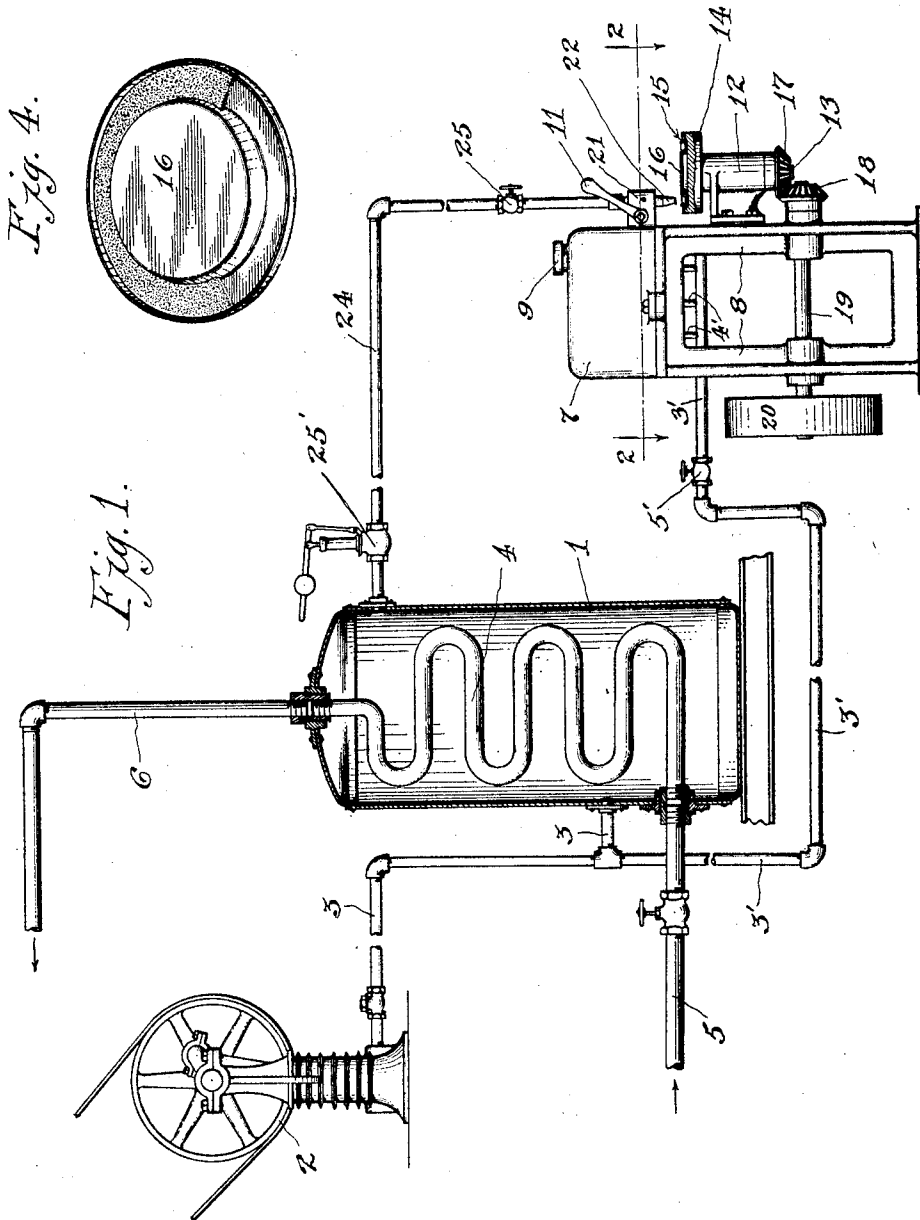


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APPLICATION FILED FEB. 13, 1918.

1,318,935.

Patented Oct. 14, 1919.
2 SHEETS—SHEET 1.



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Fig. 2.

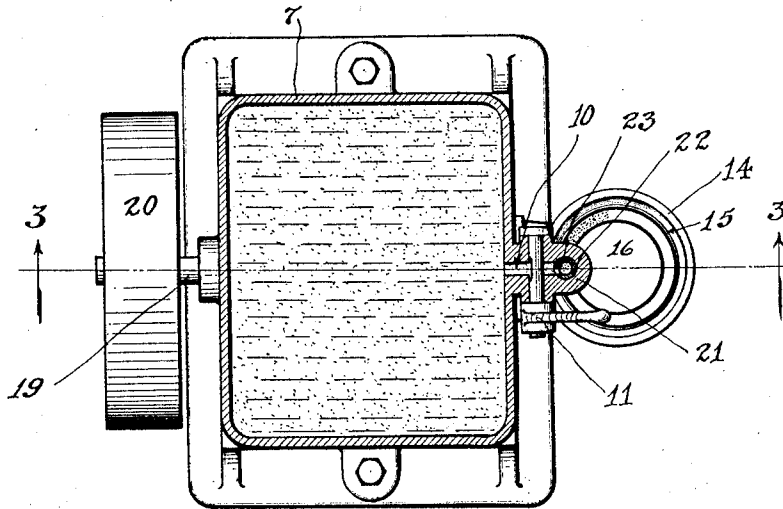
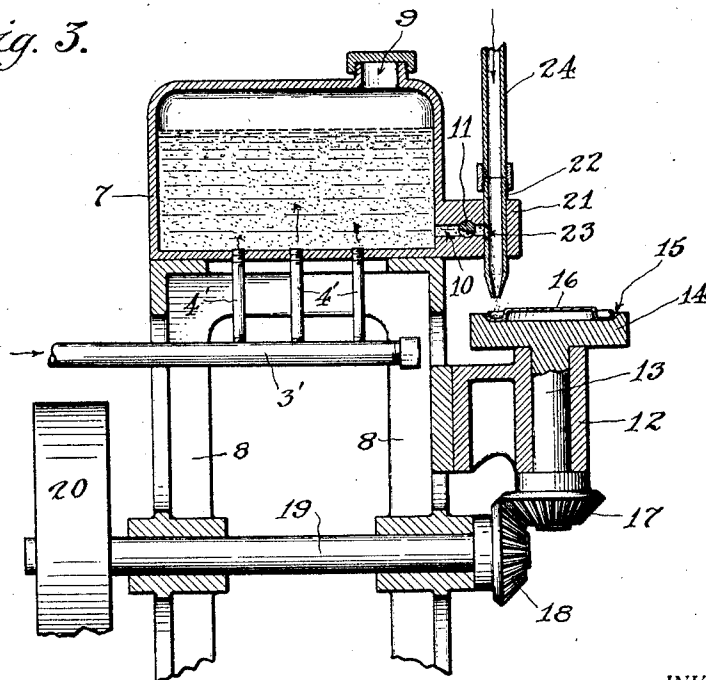


Fig. 3.



WITNESS.

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UNITED STATES PATENT OFFICE.

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METHOD OF GASKET-LINING CAN ENDS.

1,318,935.

Specification of Letters Patent.

Patented Oct. 14, 1919.

Application filed February 13, 1918. Serial No. 216,996.

To all whom it may concern:

Be it known that I, IVAN D. THORNBURGH, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Methods of Gasket-Lining Can Ends, of which the following is a specification.

The hereinafter described invention relates to a method for preparing can ends for subsequent use in the art of hermetically sealing filled containers, more particularly that class of containers designed for the preservation of food products; the object of the invention being to provide the flange of the can ends with a paper or other fibrous liner without the employment of the complex machinery heretofore employed in connection with the gasket lining of such can ends, and avoiding the waste which follows the cutting of gasket liners from liner material.

The usual practice in connection with the forming of gasket liners applied to the flange of can ends for use in the hermetic sealing of what is known in the art as "sanitary cans" or containers, is to cut the paper ring liners either from a web or from a blank of suitable liner material and thereafter to apply the liner so cut to the flange of the can ends as an integral liner. Inasmuch as the gasket liner is cut from a web or from a blank of liner material, there is considerable waste of the paper employed from which to produce the gasket liner and somewhat complex machinery is required for the cutting of such liners. Owing to the fragile character of the cut liner considerable care is required in the subsequent handling thereof for the proper application of the same to the flange of the can end to be lined. The loss occasioned by the waste resulting from the cutting of the gasket liner from the stock of liner material is considerable to the manufacturers where a large quantity of lined can ends are required, the same running into millions per year, and the expense incident to the construction and operation of the machinery required for the cutting of the ring liners and assembling of the same relative to the can ends is likewise somewhat heavy. These are items of importance to those engaged in the production of cans or containers required for the hermetic sealing of perishable goods, and it is

the loss occasioned by the waste of the paper and the expense incident to the construction of the cutting machinery and the assembling of the cut liners relative to the can ends which the present invention obviates, while efficiently, quickly and economically lining the can ends. The method of lining the can ends comprises the forming of a free flowing pulp mixture composed of fibrous material and water, the fibrous material utilized in the present case being that known as paper-stock. The pulp employed in carrying out the invention is a mixture comprising approximately ten parts of water to one part of paper-stock, and the mixture so formed is forced or sprayed under pressure through the medium of a stream of heated air directly onto the flange of a positioned can end until a sufficient quantity of the pulp mixture has been applied to cover the entire surface of the can end flange, when the flow of the pulp mixture is cut off and the moisture expelled from the body of pulp deposited on the flange of the can end. After the moisture has been expelled from the pulp there is left a thin deposit or intermingled layer of dry pulp on the flange of the can end, which adheres thereto as an integral body and serves as a gasket liner for the hermetic sealing of the can end to a can body. Preferably, the moisture is expelled from the pulp mixture deposited onto the flange of the can end by maintaining thereon the jet of heated air after the flow of the pulp has been cut off, which flow of heated air is maintained until substantially all the moisture has been expelled from the deposited pulp material, although, it is obvious, that any suitable means may be resorted to for expelling the moisture from the pulp, for the drying thereof after being deposited on the flange of the can end. The fibrous material or paper-stock is strong and tenacious, can be obtained at a small expense and is admirably adapted for the production of an integral gasket liner when applied to the flange of the can end and the moisture expelled therefrom.

The step of the method invention consists in forming a pulp mixture from what is commonly known as paper-stock, the mixture being of such a character as to freely flow from within the container therefor, forcing the mixture under pressure through the medium of a jet stream onto the flange

of a positioned can end, and maintaining the flow of intermixed air and pulp onto the flange of the can end until the entire surface thereof has been properly coated, thence expelling the moisture from the pulp so applied to the can end flange in order to leave deposited thereon a thin integral gasket liner.

Any suitably constructed apparatus may be employed for the carrying out of the invention, a simple, efficient and practical apparatus for such purpose being illustrated in the accompanying sheet of drawings, wherein,

Figure 1 is a side elevation of an apparatus designed for the carrying out of the invention, the air pressure tank or reservoir and the rotatable holder or turret for a can end to be lined being sectioned.

Fig. 2 is a horizontal sectional top plan view taken on the line 2—2 Fig. 1 of the drawings, and viewed in the direction of the arrows.

Fig. 3 is a vertical sectional view taken on the line 3—3 Fig. 2 of the drawings and viewed in the direction of the arrows.

Fig. 4 is a perspective view of a partly lined can end.

In the drawings, the numeral 1 is used to designate any suitably constructed air receiver, 2 an air compressor for delivering air into the receiver 1 under pressure through the pipe line 3. Within the receiver is located a heating coil 4, which receives steam through the supply pipe 5 connected therewith, the steam flowing through the coil 4 escaping through the outlet pipe 6 connected therewith. It will be understood that any suitable means may be employed for heating the air delivered under pressure into the air receiver 1, preference being given to a heating coil owing to the simplicity thereof. A slight distance from the air receiver is positioned a pulp reservoir or container 7, which reservoir is sustained by a suitable frame 8. The pulp mixture is delivered into the container or reservoir 7 through the medium of the cap controlled inlet opening 9 and pulp is withdrawn from the reservoir or container 7 through the outlet port 10 of a bracket or projection extended from the reservoir, which said port is controlled by means of a hand actuated regulating valve 11. The frame 8 supports a bracket 12 through which is extended the stem 13 of a rotatable can end holder or turret 14, which said holder is provided with a suitable retaining seat 15 for the reception and retention of a can end 16 to be lined. The stem 13 carries at its lower end a pinion 17 which meshes with a pinion 18 secured to one end of a drive shaft 19, which shaft is driven from any suitable outside source of power, as for instance by means of a power belt working over the belt

wheel 20 secured to the end of the shaft 19 opposite to that carrying the pinion 18. Through a ported bracket 21 extended from the pulp reservoir 7 is vertically extended a suitable jet directing nozzle 22, which projects a slight distance below the bracket 21 and the discharge orifice of which is in axial alinement with the flange of a positioned can end 16 to be lined. The said nozzle 22 is formed with an inlet port 23 in open communication with the pulp discharge port 10 horizontally disposed relative to the bracket 21. The nozzle 22 is connected to the air receiver by the pipe line 24, and the flow of air from the receiver through said pipe line to the nozzle 22 is regulated by the hand controlled valve 25. There is introduced within the pipe line 24 adjacent to the air receiver 1, a pressure controlled regulating valve 25', which serves to relieve the pressure in the air receiver on a given pressure within the said receiver being exceeded.

In the operation of the machine the receiver 1, is filled with air under pressure from the compressor 2, and the air is heated to a given temperature, approximately 120 degrees of heat through the medium of the steam coil 4 arranged therein. It will be understood that during the operation of the machine the can end holding turret 14 is in continuous rotation and that the can end 16 to be lined is placed within the seat 15 of the said turret. With the can end thus positioned, the valve 25 of the pipe line 24 is opened to permit a jet of heated air under pressure to be projected onto the flange of the can end 16, and the valve 11 is thrown to open the outlet 10 of the pulp reservoir 7. The suction created by the stream of heated air flowing through the nozzle 22 draws the pulp from within the container 7, which communicates and intermingles with the stream of heated air and is ejected under pressure as a stream mixture onto the flange of the revolving can end 16. On a sufficient quantity of the pulp being sprayed or ejected onto the flange of the can end so as to entirely cover the surface thereof, the flow of pulp is cut off by throwing the valve 11 to close the port 10, and thereafter the stream of heated air is permitted to continue to flow onto the body of pulp placed onto the flange of the can end, the heat of said stream expelling the moisture from the pulp mixture and drying the same, thereby leaving deposited on the flange of the can end a thin integral fibrous gasket liner. The flow of the heated air is then cut off and the can end removed from within its seat, when the operation is repeated on the introduction of an unlined can end into the seat of the rotatable turret 14. It will be understood that the body of pulp within the container or reservoir 7 should preferably be kept under agitation in order to prevent the settling of

the fiber of the paper-stock within the reservoir and for this purpose there is extended from the air line 3 a branch air pipe 3' which leads to jet nozzles 4' extended through the bottom of the reservoir 7, the air under pressure to said jet nozzles being controlled by the valve 5'. On the opening of the valve 5', air under pressure is admitted to the jet nozzles 4' and is ejected therefrom onto the confined body of pulp mixture, as streams of air under pressure, the jet streams thus admitted maintaining the pulp within the container in a condition of agitation and preventing the settling of the paper stock.

Inasmuch as the pulp is spread onto the flange of the can end as an intermixed stream of air, water and pulp, there is a thorough mixture of the pulp as discharged with the body of air onto the flange of the positioned can end and the intermixture thus produced causes a bond union between the fibers of the fibrous material or the paper-stock used from which to produce the pulp mixture, which when applied to the can end and the moisture removed therefrom forms a compact integral pulp gasket liner for the hermetic sealing of a container when the lined can end is seamed thereto.

Usually where a mixture is utilized for applying to the flange of a can end for the forming of a compound liner thereof, there is intermixed with the material from which the liner is to be formed a suitable adherent for causing an adhesion of the mixture after the application thereof to the flange of the can end, such adherent being required in said cementitious compound in order to secure the proper cohesion between the particles of the materials used for the forming of the compound. Experiments under the present invention for the lining of can ends for the hermetic sealing thereof to can bodies or containers of food products has demonstrated that such adhesive material is not required to be embodied within the pulp mixture and that the same may be successfully eliminated, inasmuch as the fibrous portions of the pulp applied in the manner hereinbefore set forth when dried forms a homogeneous mass, so that the deposit left onto the flange of the can end after the removal of the moisture therefrom is an integral pulp liner. There being no adhesive material of any kind employed in connection with the compound utilized under the present method for the pulp lining of can ends, the liner so applied to the flange of the can end is sanitary in all respects.

In carrying out the invention any suitable form of fibrous material may be employed as the stock from which to produce the pulp mixture for the forming of the gasket liners therefrom, which stock may be procured from the manufacturers of paper in

the form of a thick heavy dough compound which when suitably reduced by the intermixture with water in approximately the proportion of ten parts of water to one part of the compound forms a thin even flowing pulp mixture of a character admirably suited for the formation of the thin gasket liners required in the art for the hermetic sealing of the can ends and can bodies.

While preference is given to expelling of the moisture from the deposited pulp mixture, through the medium of a continuance of the heated air jet directed onto the applied pulp mixture after the cutting off of the pulp supply, it is obvious that various means may be resorted to for this purpose.

Inasmuch as the pulp mixture is drawn into the nozzle and discharged therefrom through the medium of the hot air under pressure, it is apparent that the pulp mixture is raised to the temperature of the heated stream and as the two discharge from the nozzle as an intermixed stream a certain proportion of the moisture contained within the pulp mixture is evaporated therefrom prior to being applied to the flange of a positioned can end, so that the same is deposited onto the flange of the said end as a semi-solid body.

It will be noted that under the described method there is a gradual building up of the gasket liner relative to the flange of the can end, the jet pressure under which the pulp is applied being such as to cause the fibers of the pulp to thoroughly interlace, the result being after the expelling or the evaporation of the moisture from the deposited pulp the formation of an integral gasket liner. This building up of the pulp and the inter-binding or bonding of the fiber thereof as applied to the surface of the can end, causes a final deposit of the pulp as a homogeneous mass, equal in all respects to a gasket liner cut from a body of liner material.

Having thus described my invention what is claimed as new and desired to be protected by Letters Patent is:

1. The method of gasket lining can ends for use in the art for the hermetic sealing of containers, which consists in ejecting onto the flange of a positioned can end an intermixed jet stream of pulp and air until the surface thereof has been properly coated, thence cutting off the supply of pulp, and finally expelling the moisture from the pulp mixture deposited onto the flange of the said can end.

2. The method of gasket lining of can ends for use in the art for hermetic sealing of containers, which consists in ejecting under pressure onto the flange of a positioned can end an intermixed jet stream of pulp and heated air, cutting off the supply of pulp to the jet stream after the coating of

the flange of the said can end and thereafter maintaining the stream flow of heated air onto the deposited pulp mixture for expelling the moisture therefrom.

5 3. The method of gasket lining of can ends for use in the art of hermetic sealing of containers, which consists in ejecting onto the flange of a positioned can end a pulp coating consisting of a mixture of fibers of
10 paper stock and water, cutting off the flow of the pulp mixture on the coating of the said flange therewith, and thence expelling the moisture from the applied pulp to leave an integral liner deposited relative to the
15 flange of the can end.

4. The method of gasket lining of can ends for use in the art for the hermetic sealing of containers, which consists in forming a pulp mixture of water and paper-stock,
20 maintaining the mixture under agitation and directing a jet of heated air under pressure onto the flange of a positioned can end while pulp is intermixed therewith until the flange of the can end is coated with a deposit of the pulp, thence cutting off the flow
25 of the pulp to the air stream and maintaining the stream of heated air onto the applied pulp for expelling the moisture therefrom.

5. The method of gasket lining can ends,
30 which consists in directing a jet of fibers of paper pulp onto the flange of a positioned can end under pressure to cause an inter-binding of the fibers thereof, maintaining the pulp flow relative to the said flange until thoroughly coated, thence expelling the
35 moisture from the applied pulp to leave deposited on the can end flange a built up integral gasket liner.

6. The method of applying a gasket liner
40 to the flange of a revolving can end, the same consisting in directing under pressure a jet stream of fibers of paper pulp onto the

flange of the can end until entirely coated and thence removing the moisture from the applied pulp to leave a built up integral gas- 45
ket liner deposited onto the can end flange.

7. The method of gasket lining can ends, the same consisting in building up a liner by applying under pressure a jet stream of
50 fibers of pulp to the flange of the can end for the coating of the surface thereof, and causing the removal of the moisture from the applied pulp for the leaving of an integral pulp ring liner on the flange of the
55 said end.

8. The method of producing gasket-lined can ends, which consists in forming a freely fluid and relatively thin mixture of paper pulp and water, in which mixture the water considerably predominates in proportion
60 over the fibrous elements, depositing said mixture on a can end, and removing the water so as to leave the paper fibers adherent directly to the can end in the form of a thin gasket. 65

9. The method of producing gasket-lined can ends, which consists in forming a freely fluid and relatively thin mixture of paper pulp and water, in which mixture the water considerably predominates in proportion
70 over the fibrous elements, depositing said mixture on a can end in such manner as to build up successive layers of intermingled fibers, and removing the water so as to leave the paper fibers adherent directly to
75 the can end in the form of a thin gasket.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IVAN D. THORNBURGH.

Witnesses:

N. A. ACKER,

D. B. RICHARDS.