K. UPTON.

MACHINE FOR COOLING GLUE AND ALLIED SUBSTANCES.

APPLICATION FILED DEC. 20, 1916.

1,237,587.

Patented Aug. 21, 1917.

8 SHEETS—SHEET 1.

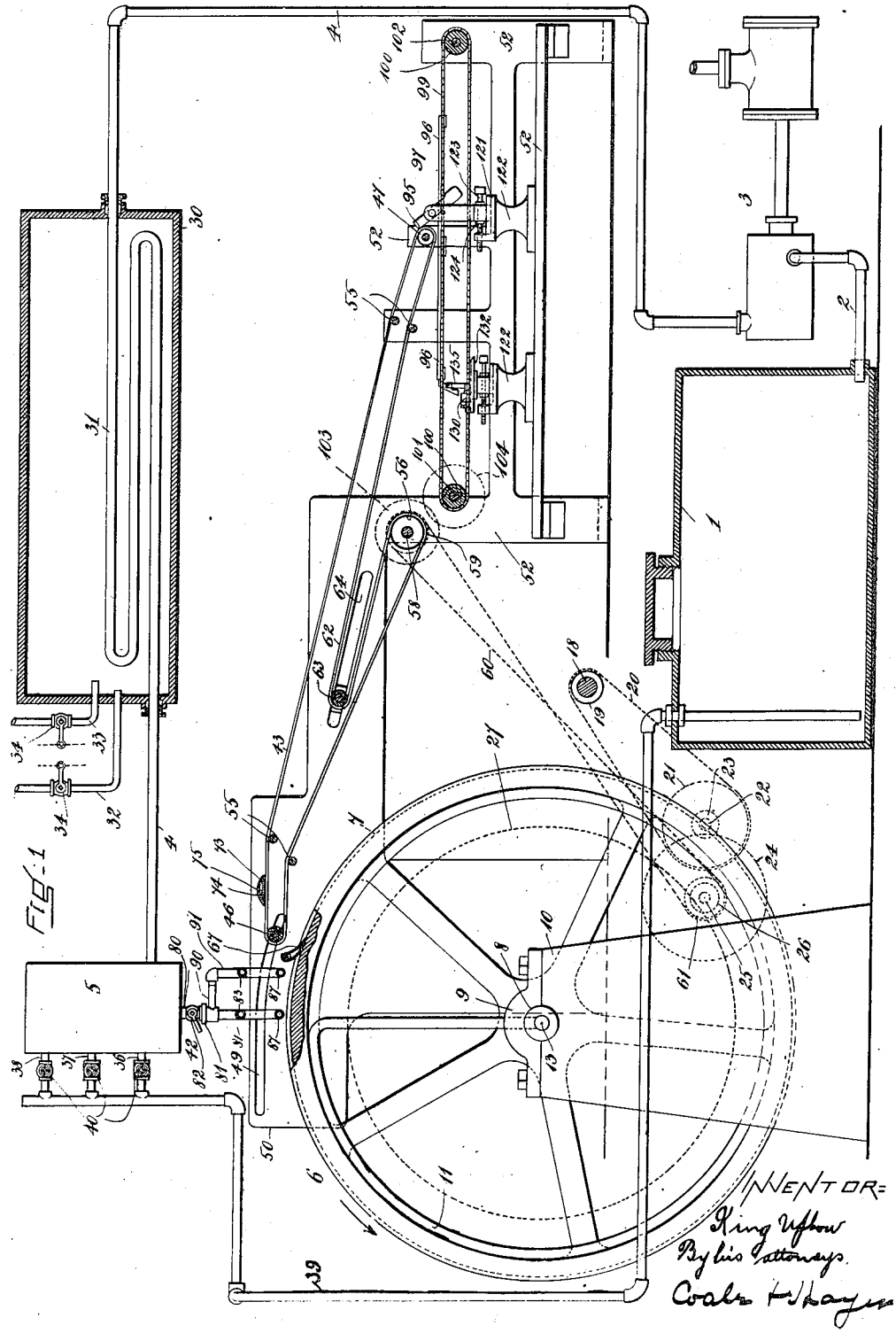


Fig. 1.

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8 SHEETS—SHEET 2.

Fig. 1a

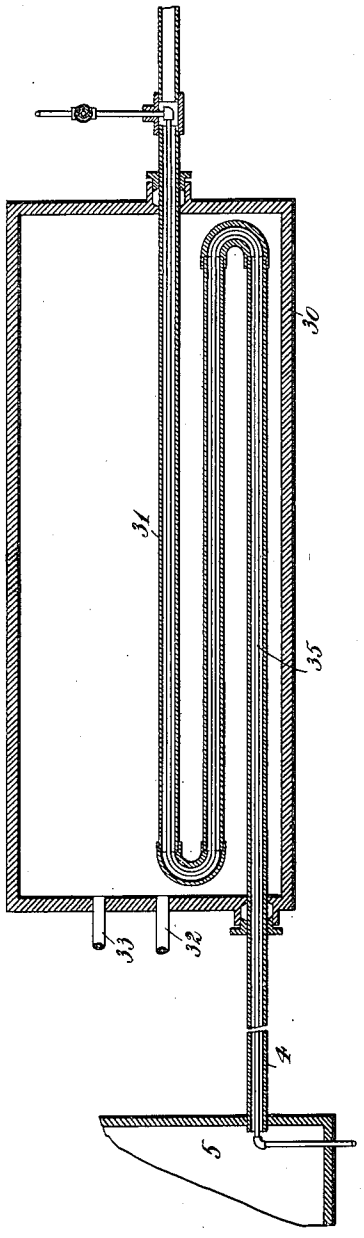
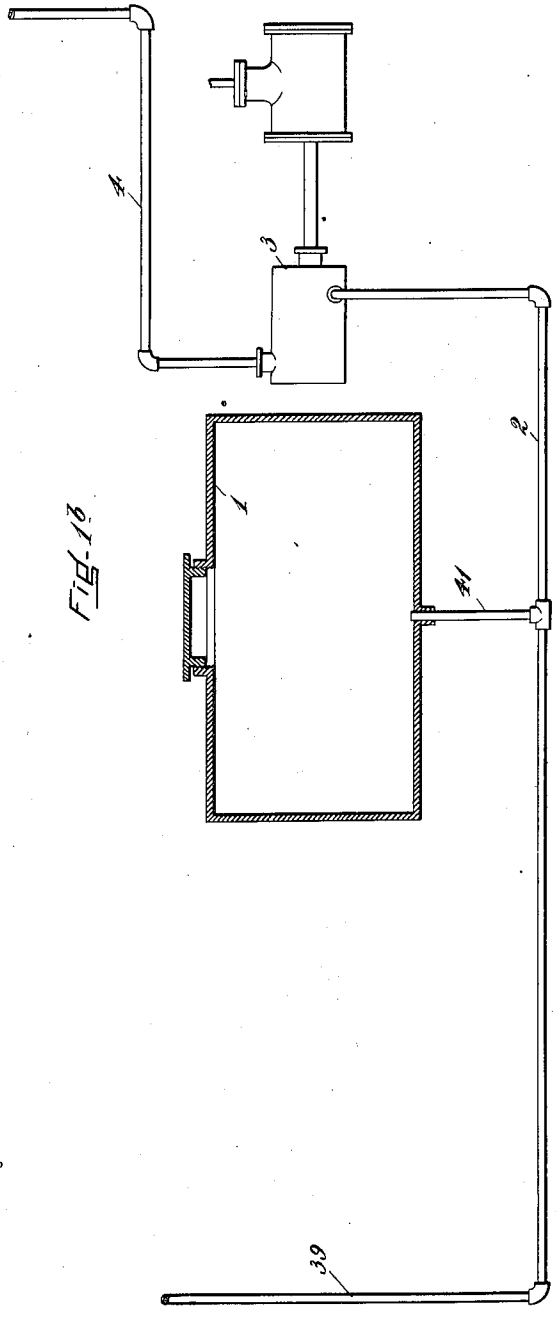


Fig. 1b



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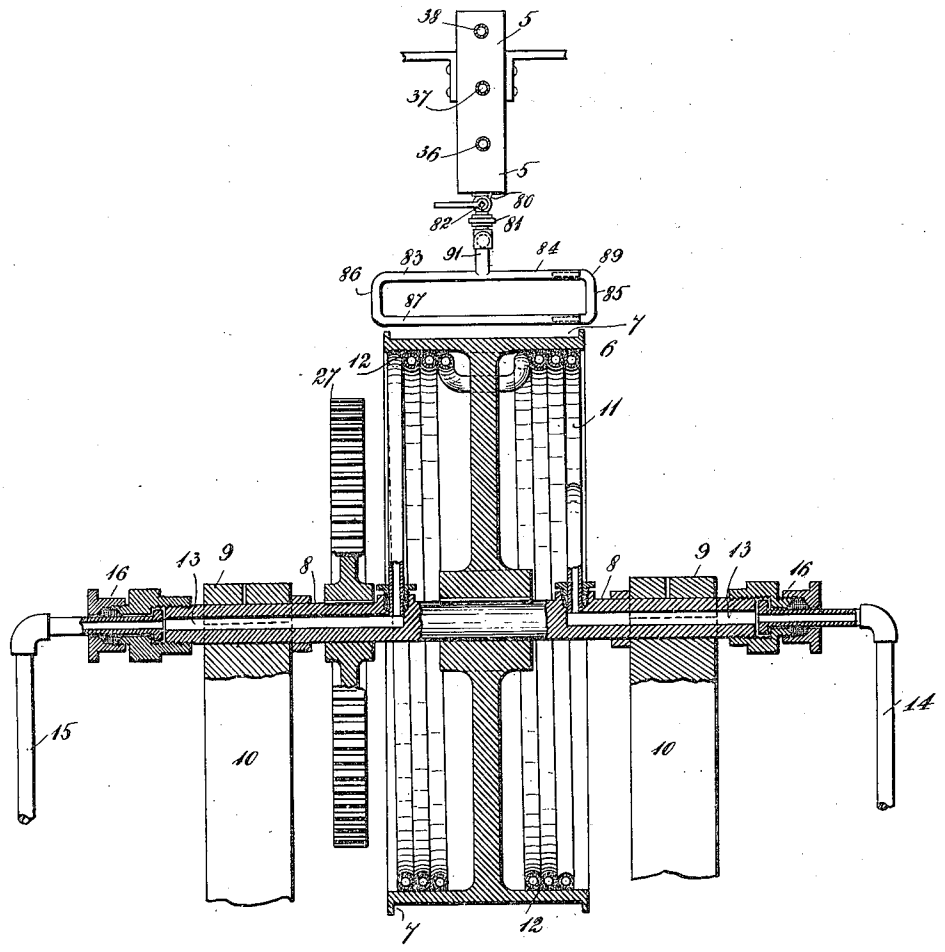
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8 SHEETS—SHEET 3.

Fig. 2.



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8 SHEETS—SHEET 4.

Fig. 3.

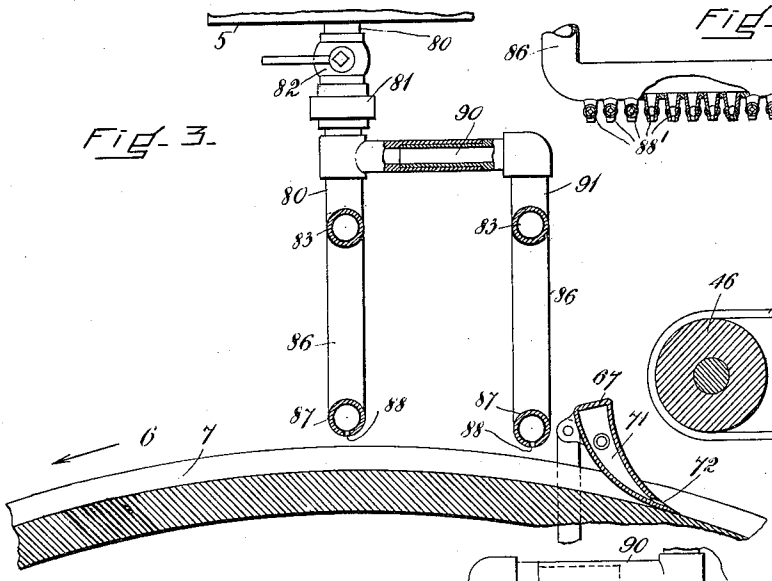


Fig. 5a

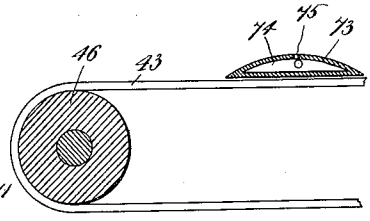


Fig. 4.

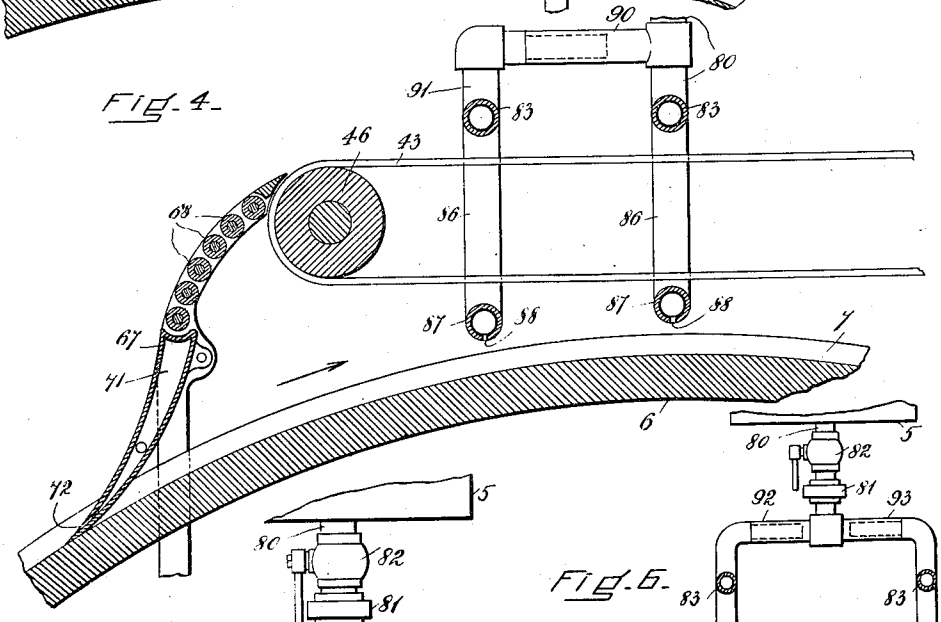


Fig. 5.

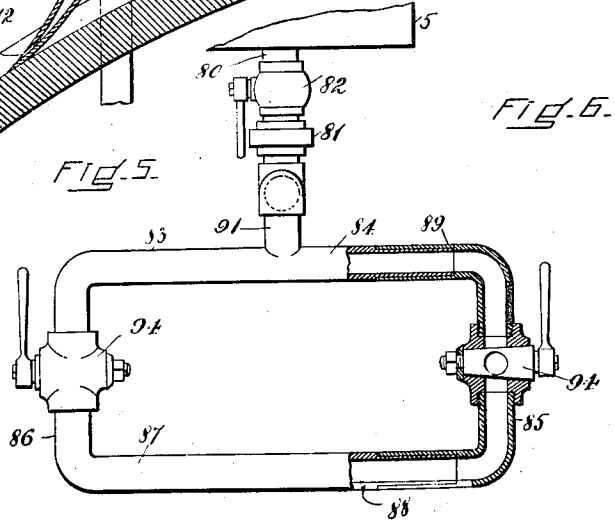


Fig. 6.

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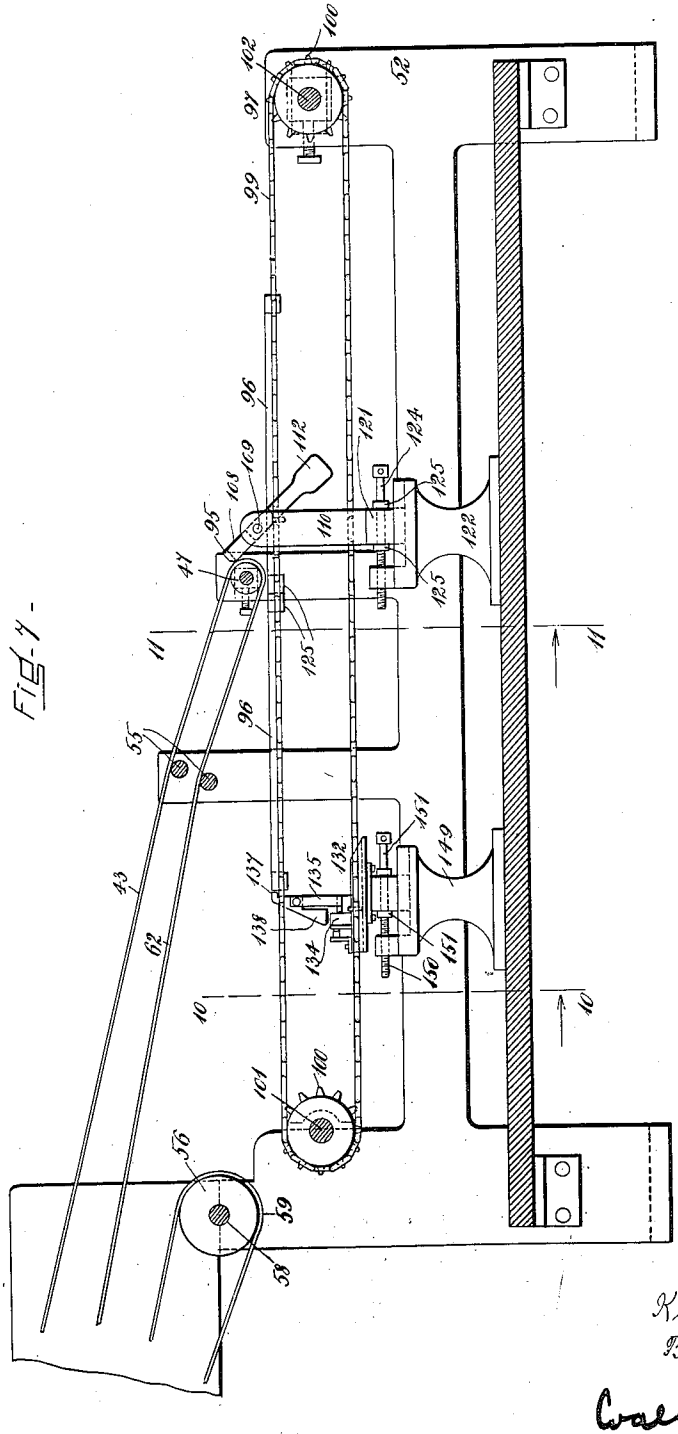
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8 SHEETS—SHEET 5.

Fig. 4.



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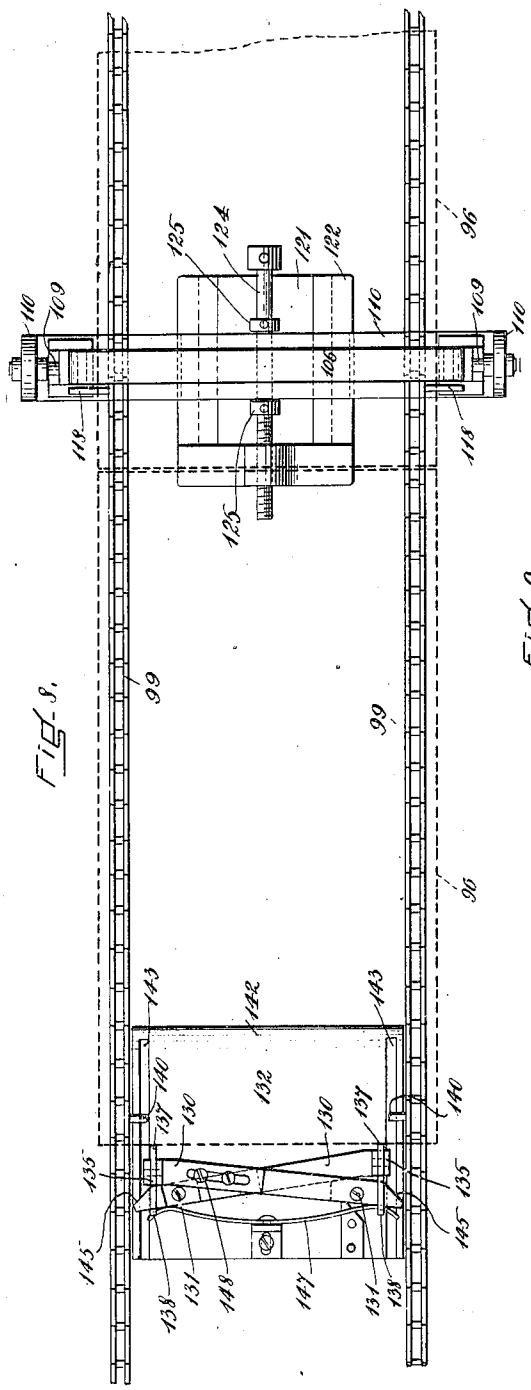


FIG. 8.

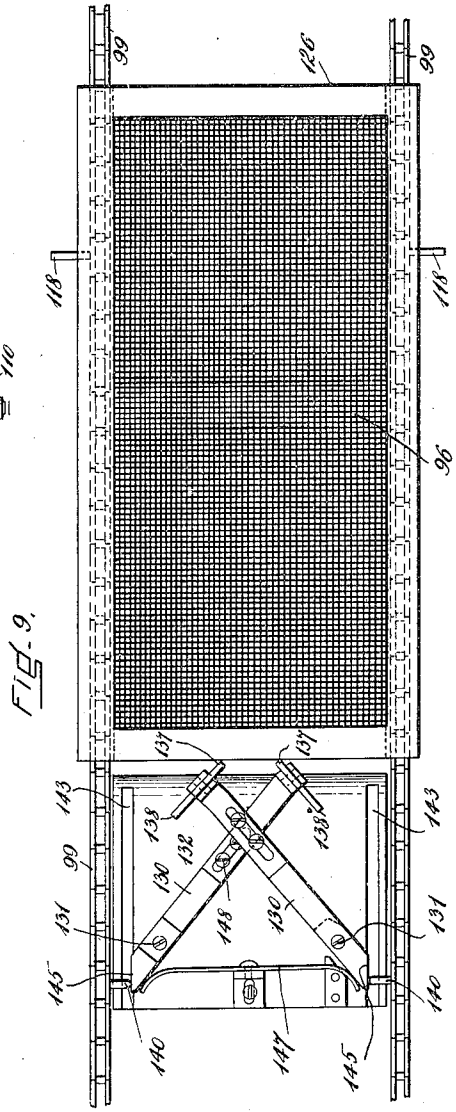


FIG. 9.

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8 SHEETS—SHEET 7.

Fig. 11.

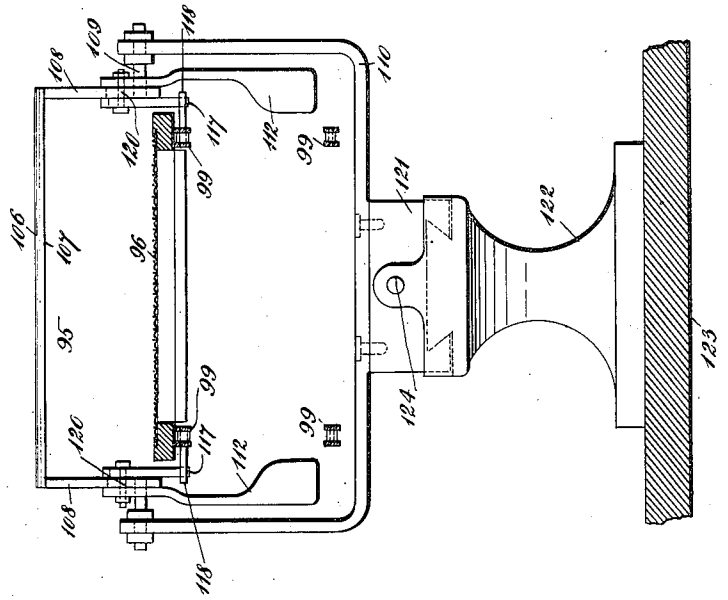
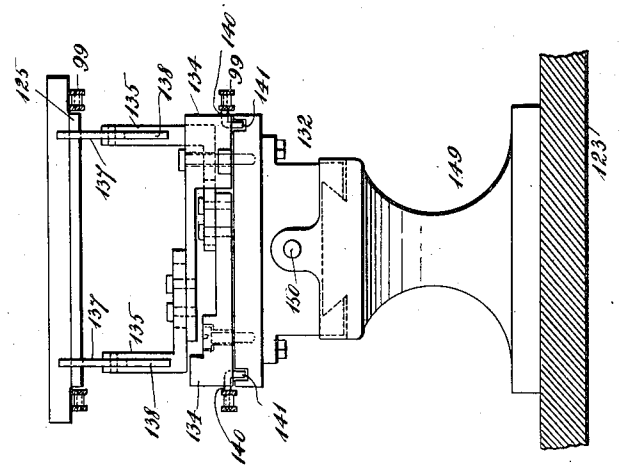


Fig. 10.



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8 SHEETS—SHEET 8.

FIG. 12.

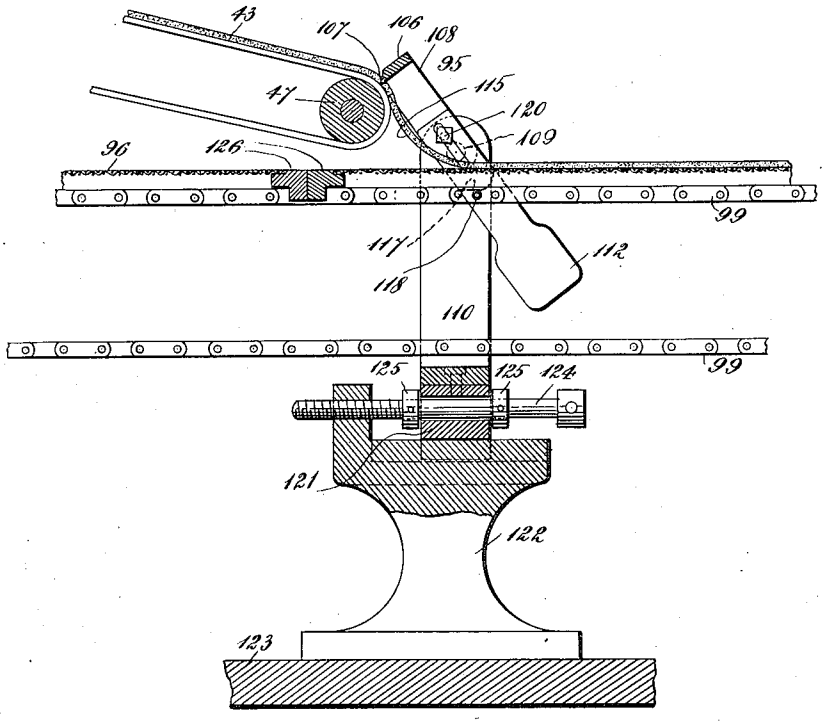
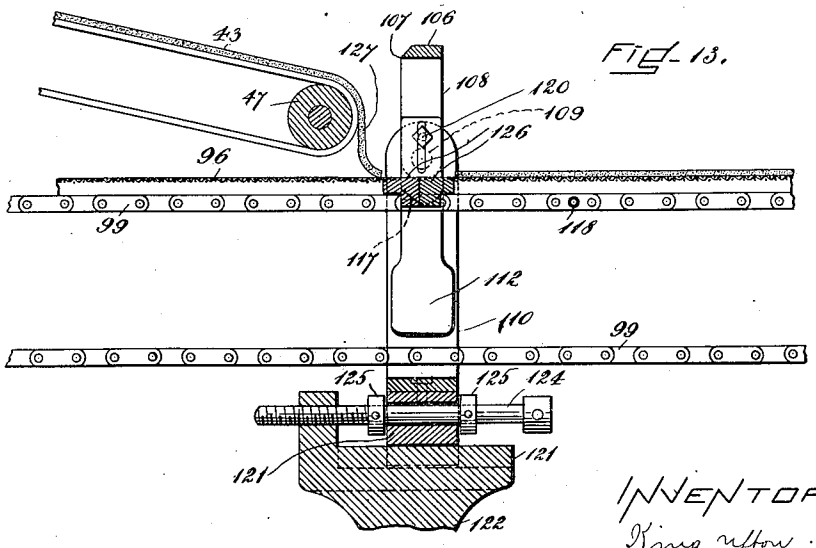


FIG. 13.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR COOLING GLUE AND ALLIED SUBSTANCES.

1,237,587. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed December 20, 1916. Serial No. 138,093.

To all whom it may concern:

Be it known that I, KING UPTON, of Marblehead, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Machines for Cooling Glue and Allied Substances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a machine for cooling and otherwise treating glue, gelatin and allied substances preparatory to drying.

The object of the invention is to obtain in a machine of the above character the combined advantages of speed, efficiency and economy of operation and also adaptability which is much to be desired in a machine of the present kind.

The invention can best be seen and understood by reference to the drawings, in which—

Figure 1 is a general view showing the entire machine in side elevation, several parts being shown in section.

Fig. 1[a] is a longitudinal cross section of the cooling tank showing a slightly modified construction.

Fig. 1[b] shows mainly in end elevation certain slightly modified details of construction to which special reference will later be made.

Fig. 2 is a cross vertical section through the center of the cooling wheel.

Fig. 3 is a view partly in side elevation and partly in longitudinal section of the top of the cooling wheel, the feed and other associated parts.

Fig. 4 is the same as Fig. 3, excepting that the parts there shown have a slightly modified arrangement in accordance with the adaptability of the machine, as will later be explained.

Fig. 5 is a front elevation of a portion of the feed, shown, also, partly in longitudinal section.

Fig. 5[a] is a view partly in longitudinal section and partly in elevation of a slightly modified portion of the feed, to which special reference will later be made.

Fig. 6 is an elevation of a slightly modified form of feed.

Fig. 7 is an enlarged side elevation of a portion of the machine shown in Fig. 1.

Fig. 8 is a plan of a portion of the net carrier, afterward to be referred to, and associated parts.

Fig. 9 is also a plan of a portion of the net carrier with a net thereon and associated therewith a device for moving the net on the carrier, the device being shown in operative position.

Fig. 10 is a section on the line 10—10 of Fig. 7.

Fig. 11 is a section on the line 11—11 of Fig. 7.

Fig. 12 is an enlarged longitudinal vertical section of a portion of the net carrier, nets thereon, and other associated parts including the cutter shown in an engaging position.

Fig. 13 is the same as Fig. 12, excepting that the disposition of certain of the parts there shown is changed and the cutter is shown in its disengaging or normal position.

Referring to the drawings:—

1 represents a receptacle, afterward to be referred to as the primary container, in which the glue to be cooled is first placed.

Leading from this primary container is a pipe connection 2 which connects with a pump 3 by which the glue is drawn from the container and forced through a pipe connection 4 into a secondary container 5 from which it is fed onto a rotary cooling wheel 6, as will later be more fully explained.

The rotary cooling wheel 6 comprises a wheel of relatively large diameter and considerable width having a channeled rim 7 of metal or other suitable cold-conducting material (see Fig. 2). The wheel is provided with trunnions 8, 8 by which it is mounted to turn within bearings 9 on the bed or frame 10 of the machine. The glue is deposited to lie in a thin sheet upon the channeled peripheral surface of the wheel and this surface is cooled by any suitable refrigerating fluid such as ammonia gas or cold brine passed through a series of coils 11 which contact with the inside surface of the metal rim. For the purpose of assisting in the transmission of cold from the refrigerating fluid through the walls of the coils to the rim, I prefer to fill the interstices left between the coils and the rim with some suitable cold-conducting material 12 such as lead. The refrigerating fluid is introduced to pass through the coils and exit therefrom for obtaining continuous circulation by the passage of the fluid through the trunnions 8

which are provided with channels 13. The fluid is introduced on one side of the wheel through one of its channeled trunnions by means of an inlet pipe 14, and makes exit from the other channeled trunnion through an outlet pipe 15. The connection between the inlet and outlet pipes and the respective trunnions is made by a suitable connection 16 of well known character which permits of the rotation of the wheel and trunnions relatively to the fluid inlet and outlet pipes 14 and 15 which remain fixed.

The wheel is turned from a main driving shaft 18 on which is arranged a pulley or sprocket 19 having a belted or chain connection 20 with a pulley or sprocket 21 arranged on a shaft 22. Arranged upon the same shaft 22 is a pinion gear 23 meshing with a gear 24 on a shaft 25. On the shaft 25 is also arranged a pinion gear 26 which engages a gear 27 fixed to one of the trunnions of the wheel (see Figs. 1 and 2).

During the passage of the glue from the primary to the secondary container and before its application to the wheel the glue is initially cooled. Such effect is obtained by the passage of the pipe 4 through a cooling tank 30, the pipe being preferably bent to have a series of coils 31 within this tank. Water is introduced into the tank through a pipe 32 from any suitable source of supply and the temperature of the water within the tank is controlled by the introduction of steam through a pipe 33. Each of the water or steam pipes 32 and 33 is provided with valves 34 for controlling the passage of water or steam through them, and in practice the water within the tank is maintained at a constant temperature by means of a thermostatic device (not shown) connecting with the respective valves, water and steam being introduced as need be to maintain the water within the tank at such constant temperature as may be desired. Should the glue become so cooled in the coils 3 as not to flow freely a quick release is provided by means of steam passed through a pipe 35 extending through the interior of the coils and preferably through that portion of the pipe 4 between the coils and the secondary container 5 (see Fig. 1[a]).

The secondary container 5, from which the glue is fed onto the rotary cooling wheel, is such as to secure a normal uniform pressure within the connections or feed leading from the secondary container and through which the glue is fed onto the wheel, thereby regulating and equalizing the flow of glue onto the wheel. The adaptation of the secondary container and parts incidental to it permits, also, of adjustment or change in the pressure of glue through the feed, thereby regulating the amount of glue deposited upon the wheel. This effect is obtained in the following manner: The secondary container is in the nature of standpipe within which the glue is maintained at a constant level. The level of the glue at any one of a series of points is secured by means of outlet pipes 36, 37 and 38, respectively, which proceed from the side of the standpipe at points one above the other adjacent the various levels desired to be attained, and which connect collectively with a return pipe 39 leading back into the primary container 1. Each of the branch pipes 36, 37, 38 is controlled by a valve 40. Any desired level of glue in the standpipe within the range provided for is obtained by opening the valve in the branch pipe opposite the point where the level is desired to be attained and closing the valve in such branch pipe or pipes as may lie below the point of the desired level. The consequence is that the glue introduced into the pipe cannot rise above the level of the entrance to the branch pipe which is open, any excess glue introduced into the standpipe passing out through the open branch pipe and thence back through the connection 39 into the primary container.

In order to prevent air entering the glue and filling it with small bubbles, thereby disfiguring and otherwise injuring the product, as it might otherwise do, it will be observed that the pipe 4, which connects with the standpipe, connects with the side thereof at a point below the lowest level of glue that can be maintained within the standpipe, while the return pipe 39 leading back into the primary container discharges into this container at a point just adjacent the bottom, and accordingly well below the level of glue contained in it.

In Fig. 1[b] a slightly modified arrangement is shown in that the return pipe 39 connects directly with the pipe 2 leading to the pump, while the pipe section 41 leading from the primary container connects with the union between these pipes. According to this construction the partially cooled glue returned from the secondary container passes directly to the pump with the glue drawn from the primary container with the advantage that the partially cooled glue is kept continuously in circulation without entering the primary container.

From the secondary container or standpipe 5 the glue is fed onto the rotary cooling wheel through a feed comprising a pipe fixture 42. This feed or fixture is of an adjustable character by which its position may be changed both in relation to the top surface of the cooling wheel and also to a belt 43 on which the glue sheet is deposited after being stripped from the wheel, and which operates to carry the sheet to a point where it is cut into strips and these strips laid upon racks for purposes of drying, as is customary in the present type of machine.

The construction and adaptation of the feed can better be understood by first referring to the carrier belt 43.

This belt is an endless belt of substantially the same width as that of the cooling wheel. At its inner and outer ends the belt renders around pulleys 46 and 47, respectively. The pulley 46 at the inner end of the belt is arranged above the top of the cooling wheel. It turns within suitable bearings mounted to slide within ways 49 formed upon a portion 50 of the frame of the machine. These ways are preferably slightly curved ways and are of such extension as will permit of the pulley 46 being moved along an arc extending on both sides of the vertical center of the machine (see Figs. 1, 3 and 4).

The pulley 47 is a stationary pulley and is mounted upon an auxiliary frame structure 52, which also supports other elements of the machine later to be referred to.

The belt 43 is further arranged to pass around a number of idlers 55 arranged upon the respective frames according to their location, and also around a pulley 56 arranged upon a shaft 58 turning within suitable bearings (not shown) on the auxiliary frame 52. Arranged upon this same shaft 58 is a gear 59, and the belt is driven by power applied to this gear through a connection 60 which connects with a sprocket 61 on the shaft 25, which forms a part of the driving mechanism for the cooling wheel, as before described.

Provision is made to permit of the lengthening and shortening of the belt, or, in other words, for changing the location of the inner end of the belt with relation to the top peripheral surface of the cooling wheel to which the inner end of the belt is adjacent, as follows: A loop 62 is formed in the belt by passing it around an idler pulley 63 which turns within suitable bearings (not shown), which slide within ways 64 formed upon the auxiliary frame structure 52. By sliding the pulley 63 in and out along these ways the carrier belt may be lengthened or shortened and the inner end thereof arranged as may be desired in proper relation to the top surface of the cooling wheel.

As will later be explained when reference is made to the operation of the machine, the cooling wheel is turnable in either a forward or reverse direction, and the inner end of the belt 43 is arranged in relation to the wheel according to the direction of its turning. In other words, in the direction shown in Fig. 1 the wheel is turning counterclockwise and the carrier belt is so arranged that its inner end will lie forward of the vertical center of the wheel, while in Fig. 4 the wheel is shown turning with a clockwise movement and the belt is so arranged or lengthened that its inner end lies adjacent the wheel to the rear of its vertical center. In either event, irrespective of the location of the inner end of the belt, the glue is taken off the cooling wheel and directed onto the inner end of the belt by means of a doctor 67 fixed in a suitable manner to the frame 50 of the machine. The form of the doctor will vary slightly depending upon the direction the cooling wheel is turning and the work to be performed by the doctor. In accordance with the operation of the machine shown in Fig. 1 where the glue is taken off the wheel turning with a counterclockwise movement, the doctor is curved so as to change the direction of the glue sheet as it is taken off the wheel, and directed upwardly around and onto the inner end of the belt. In the construction shown in Fig. 4 where the wheel is having a clockwise movement, the doctor is formed simply to strip the glue sheet from the wheel and permit of the sliding of the sheet over it and thence upwardly onto the inner end of the carrier belt.

To facilitate the passage of the glue onto the inner end of the belt in the arrangement last referred to, I prefer to fill the space between the doctor and the inner end of the belt with a series of small rolls 68 over which the sheet of glue may slide, thereby reducing friction and preventing any tendency for sticking which would retard the movement of the sheet. The rolls 68 as shown are mere idler rolls mounted upon the frame of the machine and forming, as it were, a part of the doctor. These rolls, however, if need be, may be driven rolls although under ordinary conditions a positive driving of the rolls is not necessary.

The doctor 67, in addition to performing its ordinary function of removing the glue from the wheel, is provided with a channeled or chambered interior 71 for containing water, which may be directed into the doctor in any suitable manner (not shown) and maintained therein under slight pressure. The water directed into the doctor is directed out of the same through a series of small openings 72 just adjacent the cutting edge of the doctor so that it may slightly lubricate the under side of the glue sheet stripped from the wheel by the doctor so that the sheet will not stick to the belt as it might otherwise do under certain climatic conditions. The water directed through the doctor facilitates, also, the action of the doctor in stripping the glue from the cooling wheel.

For the further purpose of preventing objectionable adhesion between the glue sheet and the carrier belt, there is associated with the belt a doctor 73 fixed to the frame of the machine and lying in close proximity to the belt so that the sheet will ride over it. The doctor 73 is provided with a channeled or chambered interior 74 for containing water, which may be directed into it

in any suitable manner (not shown), and maintained therein under slight pressure. The doctor is further provided with a series of small openings 75 in the top thereof through which the water is directed from the interior of the doctor against the under side of the glue sheet for lubricating its under surface, thereby preventing objectionable adhesion, as aforesaid.

The feed 42 is an adjustable feed, adjustable in the sense that the glue led through it is deposited upon the top peripheral surface of the cooling wheel at a point dependent upon the direction of the wheel's rotation and consequently upon the relative positions of the inner end of the carrier belt and doctor, and also at a point dependent upon the character of the glue.

The secondary container or standpipe 5, with which the feed connects, is located in a plane above the top of the cooling wheel so that the glue may gravitate therefrom through the feed onto the channeled peripheral surface of the wheel. The feed comprises a short pipe section 80 which connects with the bottom end of the container or standpipe 5. The pipe has within it a joint 81 in order that the lower portion of the pipe may turn in relation to the upper portion thereof. In the upper portion of the pipe is a cock 82 for controlling the flow of the glue from the container. From the lower end of the pipe section 81 the feed extends to the right and left by branch pipes or sections 83 and 84 respectively. Depending from the outer ends of these sections are sections 85 and 86, respectively, which are joined by a section 87 that forms the feed proper and the under side of which is provided with a slot 88 through which the glue passes onto the wheel. The pipe sections 83 to 87, inclusive, collectively form an inclosed fixture, and the arrangement of the pipe sections comprising this fixture is such that the inclosure will be of sufficient size to permit of the passage through it of the inner end of the carrier belt 43, as shown in Fig. 4. In order to provide for the adjustment of the feed and not interfere with the carrier belt, the end of the inclosed fixture is removable and accordingly on one side of the fixture telescopic joints 89 are formed in the respective pipe sections 84 and 87.

A double feed is provided in the sense that the glue may be deposited upon the wheel at separate points, one forward of the other, at the same time. Accordingly there connects with the pipe 81, to extend at right angles therefrom, a pipe section 90, from the end of which depends a short pipe section 91 and to this section is secured an inclosed fixture identical with the one indicated by parts 83 to 89, inclusive. Attention is also directed to the fact that the pipe 90, which connects the two feeds, is a telescopic pipe, permitting of the adjustment of the secondary feed in relation to the primary feed and to the top surface of the cooling wheel.

It is desirable in the operation of the feed that the glue be deposited upon the upturning side of the wheel instead of upon the downturning side, as the glue has a better chance to set and not run upon the wheel.

In the construction indicated the primary feed, or that first referred to, is a substantially fixed feed at the exact apex of the wheel, while the secondary feed is an adjustable feed, adjustable in the sense that it can be moved to assume different positions relatively to the peripheral surface of the wheel, and also in the sense that it can be turned to feed upon the upturning side of the wheel depending upon the direction of the wheel's rotation (compare Figs. 3 and 4). When the secondary feed is turned the primary feed will turn with it, both feeds turning on the joint 81, and this may be accomplished without interfering with the carrier belt by removing the ends of the fixtures inclosing the belt.

In Fig. 6 there is shown a slightly modified form of double feed in which both feeds are adjustable in relation to the peripheral face of the wheel. Here the pipe 80 is provided with branch pipes 92 and 93, respectively, extending at right angles thereto and in opposite directions. Both these pipes are made telescopic, and from the turned ends of the pipes there depend fixtures comprising parts identical with the parts 83 to 89, inclusive, of the construction first referred to. In this modified feed not only are both feeds adjustable in the sense that their positions may be varied in relation to the top surface of the wheel, but the feeds may be turned on the joint 81 to assume different positions as occasion may require.

For the purpose of assisting in evenly depositing the glue upon the wheel the pipes 85 and 86 are each preferably provided with a cock 94 as shown in Fig. 5. Instead of a slot 88 in the feed pipe 87 that pipe may be provided with a series of cocks 88′ as shown in Fig. 5ª. These cocks have an advantage over the slot inasmuch as there may be a slight difference in pressure between the middle and outer ends of the pipe which requires some compensation and this is provided for by means of separate cocks.

With the type of feed indicated the glue may be deposited upon the top surface of the wheel at practically any desired point in relation to the inner end of the carrier belt 43. The belt can also be adjusted without interfering with the feed.

The sheet of glue borne by the carrier belt 43 is cut into strips by a cutter 95 and the strips deposited upon drying nets 96 of

the usual type. The nets are borne by a net carrier 97 (see Fig. 7). In order that the cut strips of glue may be properly deposited upon the drying nets the net carrier and cutter must have a proper relative operation, both to one another and to the carrier belt 43. As will later be more fully explained, the net carrier is operated to have the same relative movement as the carrier belt and the cutter is operated at determinate intervals from off the net carrier.

The net carrier 97 comprises a pair of spaced endless chains 99, 99. These chains are parallelly arranged, each chain being arranged to turn on sprocket wheels 100, 100, which are mounted upon shafts 101, 102, respectively, turning in suitable bearings on the frame 52 of the machine. The chains are spaced from one another a distance substantially equal to the width of the drying nets 96 so that the nets may rest thereon and be carried thereby or be movable along the chains. The endless chains comprising the net carrier are arranged to extend fore and aft below the outer end of the carrier belt so that the nets will be carried to successively pass below the outer end of the belt for receiving the glue sheet as it renders off the same. The net carrier is also so far removed vertically from the outer end of the belt that an appreciable space, preferably 6 or 8 inches, will separate the outer end of the belt from the nets (see Fig. 12). The net carrier is operated from the driving mechanism to turn at substantially the same rate of speed as the carrier belt by means of intersecting gears 103, 104, respectively, one of which is arranged upon the shaft 58 of the belt-driving mechanism and the other upon the sprocket shaft 101 of the net carrier.

The cutter 95 comprises a bar 106 presenting a cutting edge 107. The bar 106 is carried by arms 108 mounted to turn on trunnions 109 on a U-shaped support 110. The arms 108 are maintained in a normal upright vertical position above their pivotal connection with the trunnions by means of overweighted arms 112 fixed to them. The arrangement of the parts is such that the cutter will normally lie just forward of the outer end of the carrier belt or of the pulley or roll 47 around which the outer end of the belt turns and above the axis of this roll. From this normal position the arms 108 and cutter bar carried by them are turned so that the cutter will engage and sever the glue strip during its passage upon the carrier belt around the roll 47. I prefer that the sheet be severed at a point lying slightly above the axis of the roll 47 so that the end or flap 115 of the severed strip of glue (see Fig. 12) will drop away from the roll onto the net.

The further arrangement of the parts is such that the cutter will be operated at determinate intervals during the operation of the net carrier and after its operation the cutter be immediately released to assume its normal position. This effect is obtained by fixing to the arms 108 bearing the cutter bar, cams 117. These cams are disposed in the normal position of the cutter to lie in the paths of studs 118 which project outwardly and laterally from the sides of the upper running portions of the net-carrying chains. As these portions of the chains move forward during the operation of the net carrier the studs carried by them will engage the cams 117 of the cutter and thereby turn the cutter for operating it. While the net carrier has a relatively slow movement the form of the cams 117 is such that when the cams are struck by the studs the cutter will first be slowly moved into an engaging position for cutting the sheet and then receive a quick impulse for performing the actual cutting operation and as quickly be released to assume its normal position by the studs riding off the cams (see Figs. 11 and 12).

It is advisable that the cutter be adjustable both vertically and in a lateral direction toward or away from the outer end of the carrier belt. The vertical adjustment of the cutter or cutter bar together with the adjustment of the overweighted arms 112 and cams 117 of the cutter is obtained by pivoting the overweighted arms 112 on the trunnions 109 and then securing the arms 108 bearing the cutter bar and also the cams 117 to the ends of the overweighted arms 112 above the trunnions, the connection being secured by a bolt and nut connection 120, which passes through slots formed in the arms 108 and cams 117, permitting of the adjustment thereof (see Fig. 11). The lateral adjustment of the cutter is secured by mounting the U-shaped support 110 upon a block 121 which is slidably mounted upon an anvil or base 122 on a bracket or support 123 on the frame 52 of the machine. Adjustment is secured and maintained by a connecting screw 124 and nuts 125 on the screw, both operating in a conventional manner (see Fig. 12).

The glue is deposited upon the drying nets in successive order, one net being borne to immediately follow the other on the net carrier. Owing to the fact that the nets are moving at the same rate of speed as the sheet of glue, which is being fed continuously from the carrier belt 43, provision is necessarily made to prevent the glue from being deposited upon the end frame pieces 126 of the nets (see Figs. 12 and 13), the said end pieces abutting one another during the feed of the nets. Such provision consists in an intermittent movement imparted to the nets on the net carrier, the nets being moved thereon in an amount substantially equal to

the width of the two abutting end frame pieces 126 of the nets. The movement takes place immediately after the operation of the cutter. After the cutting of the sheet of glue the severed end or flap 115 of the strip already deposited upon the forward net of those on the carrier will fall thereon (see Fig. 12). An appreciable interval then elapses before the end 127 of the sheet continuing to be fed by the carrier, will contact with the net following owing to the space between the point where the sheet is cut and the net. This interval is availed of to move the net on which the end 127 of the glue sheet is to be deposited forward, so that the end of the sheet will contact with the net proper clear of the frame (see Fig. 13). This movement is obtained in the following manner:—

Crossed arms 130 operating in the manner of lazy tongs are pivotally secured by connections 131 to a block 132 lying between the under running portions of the chains of the net carrier. The arms are provided with thickened inner end portions 134 (see Fig. 10) where they make their pivotal connection with the block 132, and the extension of the arms therefrom is such that the arms may slip by one another and occupy either a collapsed position as shown in Fig. 8 or an open, forward, extended position as shown in Fig. 9. The arms are provided with upturned, outer ends 135. The block 132 rises to a point about flush with the under running portion of the chains of the net carrier and the arms together with their upturned ends 135 lie below the plane of the nets arranged upon the net carrier. The arrangement of the block 132 is also such that the arms when retracted will lie back of the net following that upon which the glue sheet or strip is being deposited (see Fig. 7) at the time when the nets upon the carrier have been moved to a position to be moved forward, which movement immediately follows the operation of the cutter, as above described.

As stated above, the upturned ends 135 of the arms 130 lie below the frames of the nets. In order that the upturned ends of the arms may be extended to engage the frames of the nets for moving them as the arms are extended, the ends are each provided with a finger 137 pivotally secured to them. Each of the fingers is maintained in a normal upright position by a dependent tail piece 138 which bears against the back of the arm to which the finger is secured and which acts as a stop for holding the finger rigidly in place when thrown into engagement with the rear ends of the frames of the nets upon the extension of the arms 130. The fingers 137 are thus pivotally secured to the ends of the arms to permit of the nets being placed upon the carrier in proper succession. As any new net is placed upon the net carrier it will be moved forward by the net carrier over the fingers, which will not interfere with the frame of the net bought into contact with them, as the fingers will turn, permitting the frame of the net to be idle over them after which the fingers will assume their normal upright position.

The arms 130 are extended at proper time relatively to the operation of the cutter for moving the nets forward by means of studs 140 having turned ends 141 on the lower running portions of the chains. As the chains are turned these studs will be brought into contact with the front edge 142 of the block 132 which is beveled, the studs will ride upwardly over the beveled edge of the block and the turned ends 141 of the studs will enter grooves 143 in the block and run along these grooves during the passage of the studs over the block. The side walls of the grooves operate to hold the studs against displacement. During the passage of the studs along the grooves they will be brought into contact with beveled ends 145 of the arms 130, lying back of the pivotal connections of the arms and in the path of the studs. As the studs engage the beveled ends of the arms 130 they will have drawing engagement therewith and thereby operate to extend the arms, which operation continues until the studs slip off the ends of the arms. The arms are extended against the tension of a spring 147 secured to the block 132 and bearing against the rear ends of the arms and operating when the arms are released from the action of the studs to immediately restore the arms to their original collapsed position.

The arms 130 are preferably extensible arms in order to provide for their adjustment, for which purpose the arms are made in separate slotted sections held together by means of a bolt and nut connection 148. The adjustable positioning of the arms is also further provided for by mounting the block 132 upon an anvil or base 149 on the bracket or support 123 on the frame 52 of the machine, adjustment being secured and maintained by a connecting screw 150 and nuts 151 on the screw, both operating in a conventional manner (see Fig. 7).

In the general operation of the machine the glue is forced by the pump from the primary container 1 through the cooling tank 30 into the secondary container or standpipe 5 from which it passes onto the cooling wheel through the feed 42. The deposit of glue upon the wheel is regulated by the head of glue maintained in the standpipe, and this through closure of one or the other of the valves 40 in the pipe connections leading out of the standpipe. All excess glue which is introduced into the standpipe beyond that required to maintain

the desired head therein is returned to the primary container from the cooling wheel. The glue is stripped from the cooling wheel by the doctor 67 and directed onto the carrier belt 43 from off the end of which the glue is cut into strips and the strips deposited upon the drying nets borne by the carrier, upon which carrier the nets are movable to prevent the glue being deposited upon the frames of the nets.

The main cooling wheel 6, the carrier belt 43 and the net carrier are all driven collectively from off the main driving shaft 18 at substantially the same rate of speed. The cutter and device for moving the nets on the net carrier are operated from off the net carrier as above described. The carrier belt and net carrier always operate in the direction indicated in Fig. 1. The cooling wheel 6, however, is rotatable, as previously indicated, either in a reverse clockwise direction as indicated in Fig. 1 or in a clockwise direction as indicated in Fig. 4. The direction of the cooling wheel's rotation is controlled by the direction of rotation of the main driving shaft, which direction of rotation is controlled by any of the well known expedients (not shown). When the cooling wheel is rotating as shown in Fig. 1 the belt or chain 60, which drives the carrier belt, is a crossed belt or chain as there shown. When, however, the cooling wheel is rotated in the direction indicated in Fig. 4 the direction of rotation of the carrier belt is maintained and accordingly the connecting belt or chain 60 must not be a crossed belt or chain, but have a direct drive.

The direction of rotation of the cooling wheel depends essentially upon the character and consistency of the glue. The arrangement indicated in Fig. 1 is the preferred arrangement, inasmuch as it has the advantage that the glue sheet stripped from the wheel is reversed upon the carrier belt. Such reversal of the sheet is accomplished by rather sharply bending the sheet as it is stripped from the wheel by the doctor, but some glues will not permit of this. Therefore it becomes necessary to drive the wheel as indicated in Fig. 4 where the glue sheet is stripped from the cooling wheel and deposited upon the carrier belt without the reversal of the sheet.

The permitted adjustable fixing of the feed and carrier belt is not only a necessary incident to the direction of the wheel's rotation, but the position at which these parts are fixed depends upon the character of the glue and also upon atmospheric conditions.

The glue might of course be deposited upon the cooling wheel through a single feed. The double feed, however, permits of the glue being deposited upon the wheel in two relatively thin layers instead of in a single layer and therefore the glue is better maintained upon the wheel and has less chance to run, for the reason that the glue is first fed upon the upturning side of the wheel where it has an opportunity to become set and not run, and the second feed of glue is upon that already deposited which as said before, has become sufficiently set to prevent its running.

The machine operates with a continuity of operation, the glue sheet being continuously delivered onto the drying nets. The positive removal of the sheet from the cooling wheel, which removal is aided by the lubrication of water and also the lubrication of the under side of the sheet to prevent its sticking to the carrier belt, facilitates continuity in the operation of the machine. The operating of the cutter by the net carrier and the operating, also, of the device for moving the nets by the net carrier for changing the positioning of the nets thereon to receive the cut strips, insures a proper application of the strips to the nets, all of which tends to increase the efficiency of the machine.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States:—

1. In a machine of the type specified, the combination with a rotary cooling wheel, of a primary container for the glue to be cooled, a secondary container located above said primary container and above the wheel, a feed for the glue from said secondary container on to the wheel, means for forcing the glue from said primary container into said secondary container, and means whereby the glue may be maintained in said secondary container at a substantially constant level and any excess glue introduced therein be directed back into said primary container.

2. In a machine of the type specified, the combination with a rotary cooling wheel, of a primary container for the glue to be cooled, a secondary container located above said primary container and above the wheel, a feed leading from said secondary container for directing the glue therefrom onto the wheel, means for forcing the glue from said primary container into said secondary container, pipe connections between said primary and secondary containers and connecting with said secondary container at a plurality of points occupied by different levels of the glue maintained in said secondary container, and otherwise arranged whereby glue may gravitate therethrough from said secondary container into said primary container, and means for controlling said pipe connections whereby the glue may be maintained in said secondary container at different levels and excess glue introduced thereto be directed back to be again introduced into said secondary container.

3. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container from which glue may be directed onto said wheel, means for directing glue from said container onto said wheel, means whereby the glue may be maintained in said container at a substantially constant level and any excess glue introduced thereto be directed out of the same, and means whereby glue may be introduced into said container including the excess glue directed therefrom.

4. In a machine of the type specified, the combination comprising a rotary cooling wheel, a primary container for the glue to be cooled, a secondary container located above said wheel and from which the glue is directed onto the wheel, means for leading the glue from secondary container onto said wheel, means whereby the glue may be maintained in said secondary container at a substantially constant level and any excess glue introduced therein be directed out of the same, and means whereby glue may be directed from said primary container into said secondary container including also the excess glue directed out of said secondary container.

5. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container into which the glue is introduced and from which it is directed onto said wheel, means whereby the glue may be maintained in said container at a substantially constant level and any excess glue introduced thereto be directed out of the same, and means comprising in part a pump whereby such excess glue may again be directed into said container.

6. In a machine of the type specified, the combination comprising a movable cooling member, a primary container for the glue to be cooled, a secondary container located above the movable cooling member, a feed for the glue from said secondary container onto the movable cooling member, means whereby the glue may be forced from said primary container into said secondary container to enter the same at a point below the level of glue maintained in said secondary container, means whereby the glue may be maintained in said secondary container at a substantially constant level and any excess glue introduced therein be directed back into said primary container to enter the same at a point below the level of glue maintained therein.

7. In a machine of the type specified, the combination with a movable cooling member, of a container for holding the glue to be cooled located above said cooling member, a gravity feed for the glue from said container onto said movable cooling member, means for introducing glue into said container, and means whereby the glue may be maintained within said container at a substantially constant level.

8. In a machine of the type specified, the combination comprising a movable cooling member, a container for holding glue to be cooled located above said cooling member, a gravity feed for the glue from said container into said movable member, and means whereby any one of a number of heads of glue may be maintained in said container as described.

9. In a machine of the type specified, the combination with a movable cooling member, of a container for holding the glue to be cooled located above said cooling member, a gravity feed for the glue from said container onto said movable cooling member, means for introducing glue into said container, and means whereby the glue may be maintained within said container at any one of a series of levels as desired.

10. In a machine of the type specified, the combination comprising a movable cooling member, a primary container for the glue to be cooled, a secondary container from which the glue is fed onto the cooling member, a pipe connection between said containers by which the glue may be directed from said primary container into said secondary container, means for cooling the glue passing through said pipe, and means whereby heat may also be applied thereto as occasion may require.

11. In a machine of the type specified, the combination comprising a movable cooling member, a primary container for the glue to be cooled, a secondary container from which the glue is fed onto the cooling member, a pipe connection between said containers by which the glue may be directed from said primary container into said secondary container, means whereby an application of cold may be made to a portion of said pipe for cooling the glue passing therethrough, and means whereby steam may be introduced to pass through said portion of the pipe as occasion may require.

12. In a machine of the type specified, the combination with a movable cooling member, of a primary container for the glue to be cooled, a secondary container, a feed from said secondary container onto said movable cooling member, an initial cooling means, means whereby the glue may be forced from said primary container into said secondary container and be subjected to said initial cooling means before entering said secondary container, and means whereby a portion of the initially-cooled glue may be directed back into said secondary container with other glue directed thereto from said primary container.

13. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container from which the glue is

fed onto said wheel, an adjustable feed between said container and the wheel whereby the glue from the container may be directed to pass onto the top of the wheel at either side of the vertical center thereof, and means whereby such adjustment may be effected.

14. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container from which the glue is fed onto said wheel, an adjustable feed between said container and the wheel whereby the glue from the container may be directed to pass onto the top of the wheel at variable points on either side of the vertical center thereof, and means whereby such adjustment may be effected.

15. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container from which the glue is fed onto said wheel, and a feed between the container and the wheel, said feed having a number of connecting pipe sections comprising in part a fixture adjustably movable over the top surface of said wheel.

16. In a machine of the type specified, the combination with an endless movable cooling member, of means for simultaneously depositing glue thereon at separate points, one in advance of the other.

17. In a machine of the type specified, the combination comprising a rotary cooling wheel, a container from which the glue is fed onto said wheel, said container being located above said wheel, and a feed between the container and the wheel, said feed having a number of connecting pipe sections comprising in part separate glue-distributing fixtures adjustable relatively to one another and to the top surface of the wheel.

18. In a machine of the type specified, the combination with an endless cooling member, of a container from which the glue is fed onto said member, and a feed between the container and the member, said feed having a series of cocks through which the glue passes onto the member for insuring an even deposit of glue thereon.

19. In a machine of the type specified, a rotary cooling wheel having a channeled rim of some cold-conducting material, means for depositing glue thereon, and means for cooling the glue deposited upon said wheel, the same comprising a series of refrigerating coils in immediate contact with the interior of said rim.

20. In a machine of the type specified, a rotary cooling wheel having a channeled rim of some cold-conducting material, means for depositing glue thereon, means for cooling the glue deposited upon said wheel, the same comprising a series of refrigerating coils in immediate contact with the interior of said rim, and a filling of some cold-conducting material interposed between said coils and said rim.

21. In a machine of the type specified, the combination comprising a rotary cooling wheel, means for depositing glue on said wheel, an endless carrier belt arranged adjacent said wheel, a doctor interposed between said belt and said wheel for removing the glue from the wheel, and means whereby water may be fed through said doctor onto the glue at a point adjacent the cutting edge of said doctor.

22. In a machine of the type specified, the combination comprising a rotary cooling wheel, means for depositing glue on said wheel, an endless carrier belt arranged adjacent said wheel, a channeled doctor presenting a cutting edge for removing the glue from said wheel, said doctor being provided with openings adjacent the cutting edge thereof connecting with the channeled interior of the doctor whereby water may be fed to pass through the doctor and said openings onto the glue for lubricating the glue.

23. In a machine of the type specified, the combination comprising a rotary cooling wheel, means for feeding the glue onto said wheel, an endless carrier belt one end of which is arranged adjacent the top peripheral surface of the wheel, and means for carrying said belt whereby the position of the end thereof adjacent the peripheral surface of the wheel may be varied in relation to said surface.

24. In a machine of the type specified, the combination comprising a rotary cooling wheel, means for feeding glue thereon, a rotary endless carrier belt one end of which is arranged adjacent the top peripheral surface of said wheel, and means for carrying said belt whereby the end thereof adjacent said wheel may be adjustably varied in position on either side of the longitudinal center of said wheel.

25. In a machine of the type specified, the combination comprising a rotary cooling wheel, an endless carrier belt the inner end of which is arranged adjacent the top peripheral surface of said wheel, means for carrying said belt whereby the inner end thereof may lie adjacent said wheel on one side or the other of the longitudinal center thereof depending as said wheel is turned either in a forward or a reverse direction, and an adjustable feed whereby glue may be deposited on the top surface of said wheel in a position dependent upon the changed position of said belt.

26. In a machine of the type specified, the combination comprising a rotary cooling wheel, an endless carrier belt the inner end of which is arranged adjacent said wheel for receiving glue stripped therefrom, means for carrying said belt whereby the inner end thereof may be moved in relation to the surface of said wheel, a feed for the glue onto said wheel, said feed comprising in part a

fixture by which the inner end of the belt is passed as it is moved in relation to the surface of the wheel.

27. In a machine of the type specified, the combination comprising a rotary cooling wheel, means for depositing glue on said wheel, an endless carrier belt the inner end of which is arranged adjacent the peripheral surface of said wheel, and means for removing the glue from said wheel and depositing it upon said belt, the same comprising a doctor and a series of rolls interposed between the doctor and the belt.

28. In a machine of the type specified, the combination comprising a movable cooling member, means for depositing glue thereon to be cooled, an endless carrier belt for receiving the sheet of glue stripped from the movable cooling member, and means for applying water to the under side of said sheet.

29. In a machine of the type specified, the combination comprising a movable cooling member, means for depositing glue thereon to be cooled, an endless carrier belt for receiving the sheet of glue stripped from the movable cooling member, and a stationary doctor arranged snugly adjacent said belt and over which the sheet rides as it is carried by said belt, said doctor having openings in the top thereof admitting of the passage of water therethrough whereby water may be applied to the under side of said sheet on said belt.

30. In a machine of the type specified having a movable cooling member and an endless carrier belt for receiving and conveying a sheet of glue stripped from the movable cooling member, a net carrier arranged below the outer end of said belt whereby nets thereon are spaced therefrom, means for operating said cooling member, carrier belt and net carrier at substantially the same rate of speed, a cutter for dividing the glue sheet into strips at a point above the nets, means whereby the cutter may be operated to divide the sheet after the cut strip has been partly deposited upon a net and whereby the end of the cut strip may fall upon said net after the cutting, and means for moving the nets along said net carrier immediately after the operation of the cutter whereby the end of the sheet may become properly deposited upon the net next succeeding that upon which said cut strip is deposited.

31. In a machine of the type specified, the combination comprising a movable conveyer for the glue sheet presenting an end over which the sheet is conveyed, a cutter arranged adjacent said end of the conveyer for dividing the sheet into strips as it passes around said end of the conveyer, a movable carrier for nets on which said strips are deposited, said carrier being arranged whereby the nets thereon will lie below, and spaced an appreciable distance from, said cutter, means whereby the cutter may be operated to divide a sheet after the cut strip has been partly deposited upon a net borne by the carrier and whereby the end of the cut strip may fall upon said net after the cutting, and means whereby said nets may be moved upon the net carrier immediately after the operation of the cutter whereby the end of the sheet may become properly deposited upon the net next succeeding that upon which said cut strip is deposited.

32. In a machine of the type specified, the combination comprising a movable carrier for the glue sheet, a cutter for dividing the sheet into strips, a movable carrier for nets on which said strips are deposited, means whereby said carrier may operate said cutter at determinate intervals during the operation of the carrier, and means whereby the nets upon said carrier may be moved forward along the same by the movement of the carrier at determinate intervals during the operation thereof immediately following the operation of the cutter.

33. In a machine of the type specified, the combination comprising a movable cooling member, means whereby glue may be deposited thereon, a movable carrier belt for conveying the glue sheet stripped from said member, said belt being arranged to present an outer end over which the glue sheet passes, a cutter for dividing the glue sheet into strips, means for pivotally supporting said cutter in a normal position adjacent said end of the belt but removed therefrom, a movable carrier for nets on which said cut strips are deposited, and means whereby said cutter may be moved by said net carrier into an engaging position closely adjacent the sheet of glue passing around said end of the belt, then operated to cut said sheet and afterward be released to assume its normal position.

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