Aug. 3, 1943. G. T. PEARCE 2,325,975

MINERAL WOOL FELTING APPARATUS

Filed Nov. 16, 1940

Fig. 1.

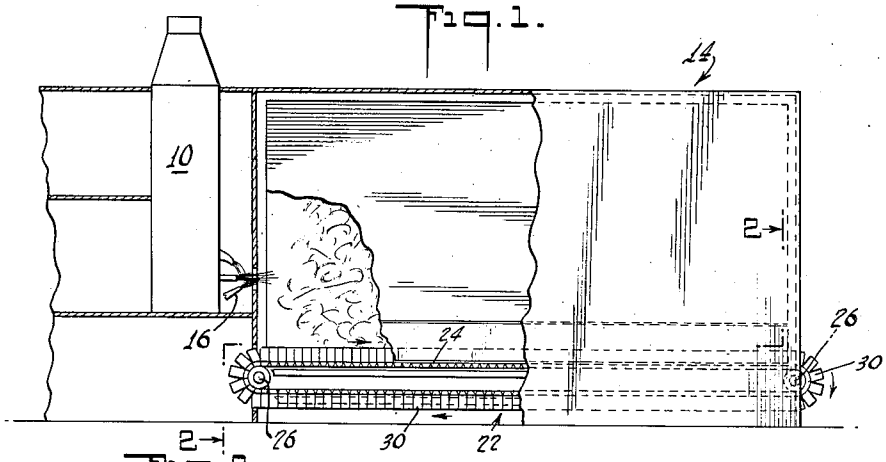


Fig. 2.

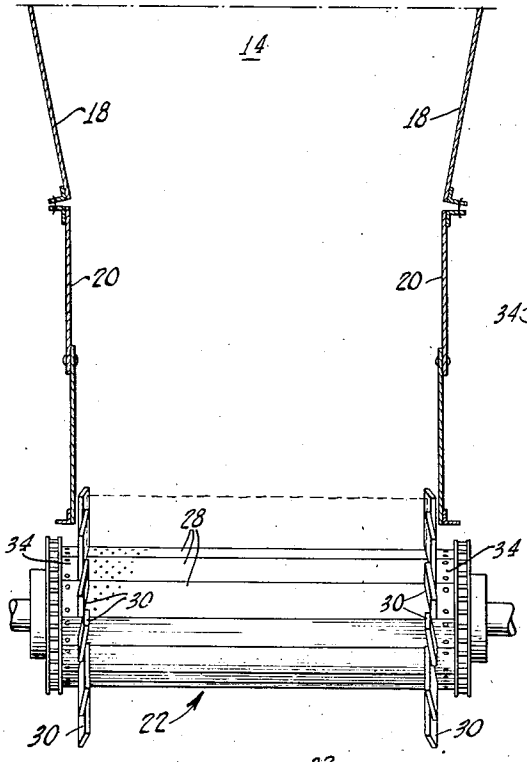


Fig. 4.

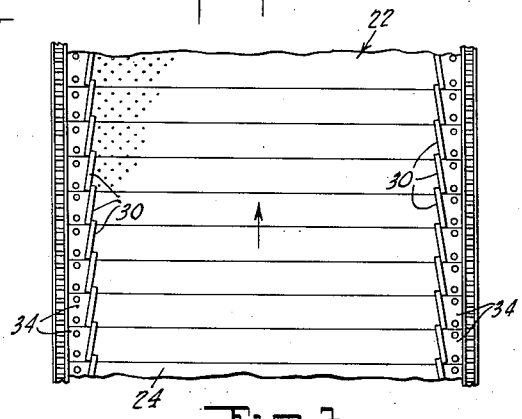


Fig. 3.

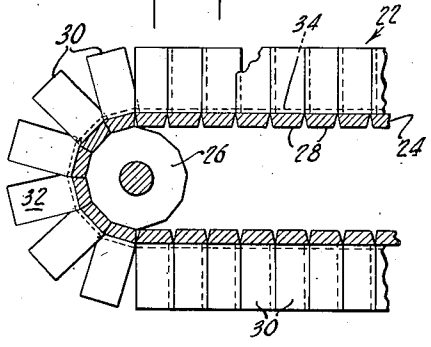
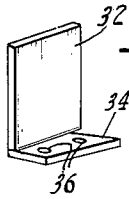


Fig. 5.



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MINERAL WOOL FELTING APPARATUS

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Application November 16, 1940, Serial No. 365,937

5 Claims. (Cl. 154—27)

My present invention relates to the production of mineral wool felts and the like, and more particularly, to improvements in mineral wool felting apparatus.

In the conventional manufacture of mineral wool felts the raw material, such as slag, rock, glass, or mixtures thereof in a molten state, is shredded into a multiplicity of fibres through the action of a steam jet or the like on a thin stream of the molten material and the fibres thus formed are carried in gaseous suspension into a settling chamber where the fibres settle in interfelted relationship upon a moving conveyor forming the chamber bottom. Usually a binder is distributed throughout the felt, suitably by injecting the binder into the suspension of fibres.

The generally relatively thick loose felt formed on the conveyor of the conventional apparatus has been found to have relatively tightly packed masses of fibres in the form of rolls or balls adjacent its edges. The presence of these fibre masses destroys the desired uniform density of the batts or blankets cut from the edge portions of the felt. Furthermore, the fibres of these masses are disarranged from their desired substantially parallel relationship to the faces of the felt. Such wads of packed fibres have been found to be further troublesome where certain binders are employed, such as drying oil binders, as, due to the tight packing of the fibres and the concentration of binder, insufficient air can reach the binder during the binder setting operation to carry off the heat generated by oxidation of the drying oil, with the result that the binder is often charred and destroyed.

It has been determined that the balling or rolling of the fibres adjacent the edges of the felt is caused by the felt rubbing upon the stationary side walls of the settling chamber. Due to the loosely felted structure of the material at this stage of the operation, the edges of the felt are held back by their frictional contact with the chamber side walls and roll up to form the relatively tightly packed masses of fibres.

The principal object of the instant invention is to overcome the above-noted difficulties in the conventional manufacture of mineral wool felts.

Another object of the invention is the provision of a settling chamber, with a conveyor so constructed that the felt will be conveyed from the settling chamber without contact with the chamber side walls.

A further object of the invention is the provision of a conveyor for a settling chamber, such conveyor including side walls of a greater height than the deposited felt and lying closely adjacent the side walls of the settling chamber to prevent any substantial loss of fibres.

My invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description thereof which is to follow and to the accompanying drawing, in which:

Fig. 1 is a view, partly in elevation and partly in section, illustrating diagrammatically a felting apparatus in accordance with the instant invention;

Fig. 2 is an enlarged fragmentary sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a detail sectional view of a portion of the conveyor shown in Fig. 2;

Fig. 4 is a fragmentary plan view of the conveyor of Fig. 2; and

Fig. 5 is a perspective view of an element of the structure.

Referring now to the drawing, and particularly to Fig. 1, there is shown a mineral wool forming and felting apparatus of generally conventional construction. The apparatus comprises a cupola 10 in which raw mineral wool forming material, such as rock, slag, glass, or mixtures of the same, or the like, are reduced to molten state. The molten material issues from an orifice and falls in front of a steam jet by which the molten stream is subdivided into a great multiplicity of fine fibres which are carried by the force of the steam jet and in gaseous suspension into settling chamber 14. A binder of any suitable or conventional type is forced into the suspension of fibres by any of the known means for this purpose. For example, an atomizing binder jet, as indicated diagrammatically at 16, may be employed for this purpose.

The settling chamber 14 includes side walls 18 having depending, substantially vertical side plates 20. Side plates 20 extend to a point adjacent an endless conveyor 22, forming the bottom of the settling chamber. Conveyor 22 comprises a foraminous belt 24 supported on rolls 26, which are driven from any suitable source of power, not shown, to move the upper reach of the belt through the settling chamber in the direction indicated by the arrow in Fig. 1. The belt 24 may be formed of a screen or the like, but preferably is comprised of narrow perforated flights 28, suitably connected in a conventional manner to permit their travel around rolls 26.

In accordance with the invention, the belt 24 of conveyor 22 carries side flanges 30 extending

upwardly beyond the thickness of the felt deposited on the conveyor (see Fig. 2). The side flanges are positioned to lie closely adjacent plates **20** of the side walls of the settling chamber, whereby loss of fibres between the side plates and flanges is substantially prevented.

The conveyor side flanges are made up of a plurality of narrow plates **32** individually secured to the belt **24**. The plates preferably extend at a slight angle to the direction of movement of the belt and are of a combined width greater than the length of the belt, whereby in the horizontal run of the conveyor the side plates slightly overlap (see Figs. 2 and 4) to provide a continuous, relatively tight side flange. Referring particularly to Fig. 5, in the preferred form of the invention each side plate **32** is provided with a horizontal flange **34**, having means such as perforations **36** for the reception of bolts, rivets, or the like. Where the flight type of conveyor is used, as illustrated, plates **32** are formed of slightly greater width than the width of a flight and are secured adjacent the ends of the flights as by bolts, rivets, or the like, passing through the perforations **36**, or they may be welded to the flights. The excess width of the plates over the flights permits each plate to extend at one edge to overlap the face of the plate on an adjacent flight in the horizontal run of the conveyor.

In the operation of the device in accordance with the invention, the mineral wool felt formed on the conveyor **22** is confined between conveyor side flanges **30**, which move with the conveyor and prevent any contact between the felt and the stationary walls of the settling chamber. As a result, the interfelted relationship of the fibres adjacent the edges of the felt is in no way disturbed and the felt passes from the conveyor to other suitable mechanism, with the fibres in substantially the relative positions in which they were deposited from the fibre suspension.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to, but that various changes and modifications will suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. In an apparatus for the manufacture of mineral wool felts including means for forming a gaseous suspension of mineral wool fibres, a settling chamber for receiving said suspension, and a conveyor constituting the bottom of said settling chamber and on which the fibres settle in interfelted relationship, the improvement comprising means carried by said conveyor for maintaining the edges of said felt out of contact with stationary elements of said settling chamber.

2. In an apparatus for manufacturing mineral wool felts including means for forming a gaseous suspension of mineral wool fibres and a binder, a settling chamber for receiving said suspension, a conveyor constituting the bottom of said settling chamber and comprising a plurality of individual flights, and side walls for said settling chamber extending toward said conveyor, the improvement comprising means composed of a plurality of overlapping members carried by the individual flights of said conveyor for maintaining the edges of said felt out of contact with said side walls to prevent substantial disarrangement of the fibres and the building up of concentrations of fibres and binder adjacent the edges of the felt.

3. In an apparatus for manufacturing mineral wool felts including means for forming a gaseous suspension of mineral wool fibres and a binder, a settling chamber for receiving said suspension, a conveyor constituting the bottom of said settling chamber, and side walls for said settling chamber extending toward said conveyor, the improvement comprising segmental side flanges carried by said conveyor closely adjacent said side walls.

4. In an apparatus for manufacturing mineral wool felts including means for forming a gaseous suspension of mineral wool fibres, a settling chamber for receiving said suspension, a conveyor constituting the bottom of said settling chamber comprising a plurality of narrow flights, and side walls for said settling chamber extending toward said conveyor, the improvement comprising substantially vertically positioned plates carried by said flights adjacent the ends thereof and forming continuous walls at opposite sides of the upper run of said conveyor.

5. In an apparatus for manufacturing mineral wool felts including means for forming a gaseous suspension of mineral wool fibres, a settling chamber for receiving said suspension, a conveyor constituting the bottom of said settling chamber and comprising a plurality of narrow flights, and side walls for said settling chamber extending toward said conveyor, the improvement comprising substantially vertically positioned plates adjacent the ends of said flights and extending at a slight angle relative to the direction of movement thereof, the plates on each flight overlapping the plates of an adjacent flight.

GALE T. PEARCE.