

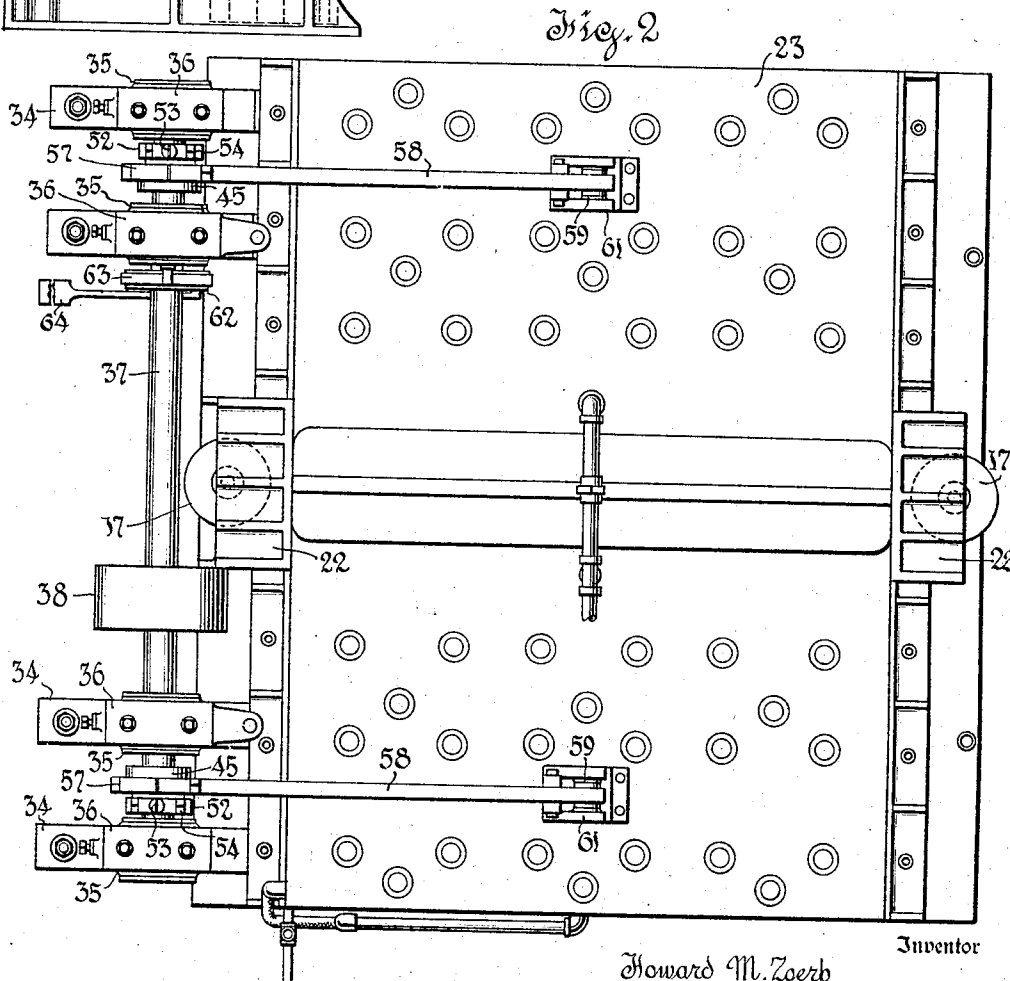
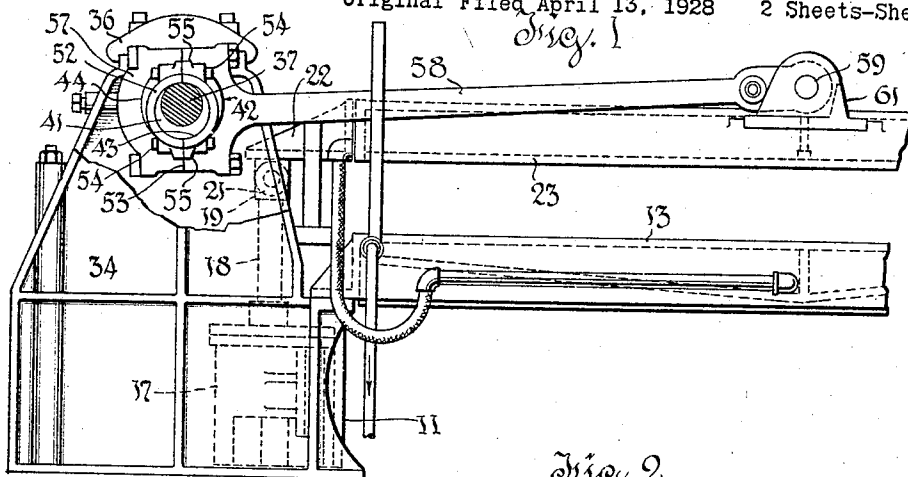
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H. M. ZOERB ET AL

1,870,940

FELTING MACHINE

Original Filed April 13, 1928 2 Sheets-Sheet 1



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Fig. 3

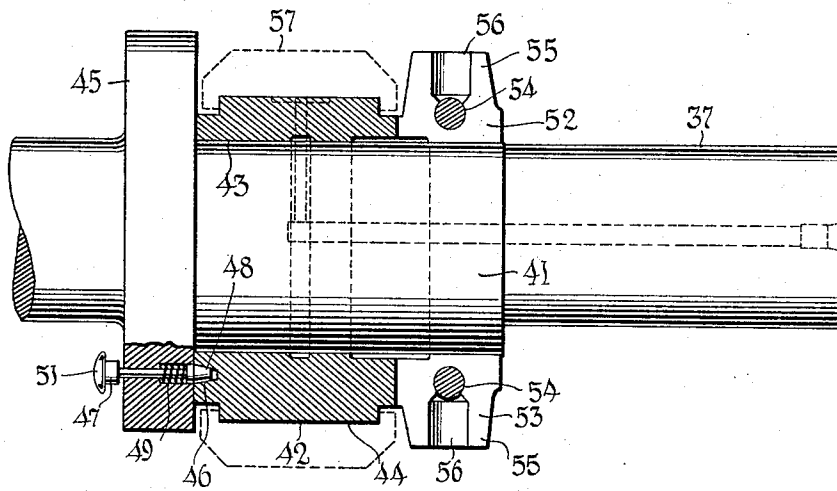


Fig. 4

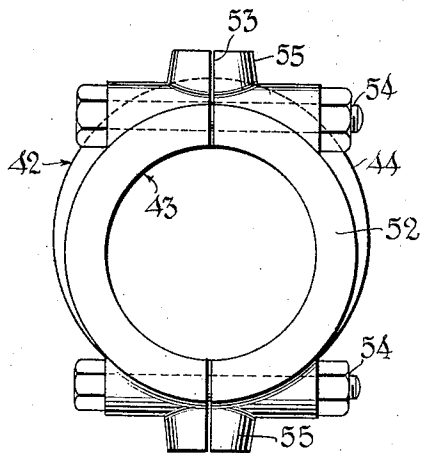
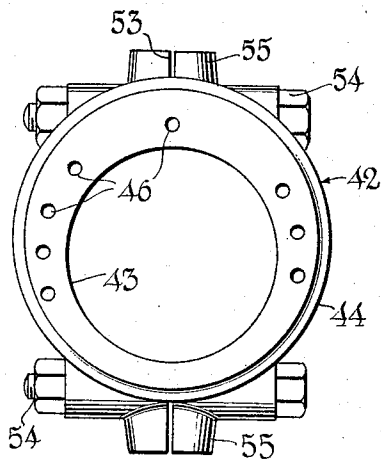


Fig. 5



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UNITED STATES PATENT OFFICE

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FELTING MACHINE

Original application filed April 13, 1928, Serial No. 269,824. Divided and this application filed May 4, 1931. Serial No. 534,567.

This invention relates to machines for producing felt or felt-like sheets and the present application is a division of our application Serial No. 269,824, filed April 13, 1928. Sheets of felt-like material made primarily of cow hair are quite extensively used as underlays for rugs and carpets, and other purposes where a relatively inexpensive padding material of reasonably good mechanical strength is required.

The invention resides in certain improvements in machines for manufacturing such felts. Such machines as heretofore constructed included two plates between which the material to be treated is received, said plates being urged yieldingly toward each other to compress the material, and at the same time reciprocated relatively to each other in a direction at right angles to the line of pressure. The effect is to compact the hairs and rub them together, thus developing as fully as possible the rather poor felting properties of the cow hair and similar materials customarily used.

Ordinarily these machines make use of a fixed horizontal supporting plate and a reciprocating overlying plate which compresses the material by its own weight. In the operation it is desired to change the amplitude of reciprocating motion to meet certain contingencies incurred in the manufacturing process. The prime object of the present invention is the provision of means for changing such amplitude of motion conveniently and accurately.

Other features of novelty will appear from the detailed description to be given of the preferred embodiment of the invention illustrated in the accompanying drawings, in which,—

Fig. 1 is a fragmentary side elevation of the machine showing the plates separated to receive raw material.

Fig. 2 is a plan view of the machine.

Fig. 3 is a view of a portion of the main driving shaft of the machine showing one of the adjustable eccentrics in detail.

Fig. 4 is a view of one of the adjustable eccentrics removed from the shaft and viewed from the right relatively to Fig. 3.

Fig. 5 is a similar view looking from the left relatively to Fig. 3.

Supported on a suitable foundation are two beam-like frame members one of which appears at 11, upon which is directly supported the lower plate 13. This is a cored casting whose specific form is not here involved.

Attached to the frame members are air lift cylinders 17, of any ordinary form, having pistons connected to piston rods 18. Each rod carries at its upper end a yoke 19 having rollers 21. These rollers 21 coast with the lower faces of brackets 22 bolted to the opposite ends of the upper plate 23.

The lift cylinders 17 are used to raise and lower the plate 23 relatively to the plate 13. Bolted to the beam member 11 and also resting on the foundation, are four frames 34, identical with each other and each formed with seats to receive substantial bearing brasses 35 which are retained by removable caps 36. These bearing brasses are alined and support the main drive shaft 37 of the machine. This shaft is rotated by a belt which runs on the pulley 38 fast on the shaft.

The frames 34 are arranged in pairs, the frames of each pair being relatively close to each other so as to support the shaft on each side of an adjustable eccentric. This double support for the shaft is advisable because of the substantial mass of the plate 23 and the heavy stresses imparted to the shaft each time the direction of motion of the plate is changed.

Between the frames of each pair the shaft 37 is formed (see Fig. 1) with an eccentric circular portion 41. In order to secure satisfactory strength this portion 41 is preferably larger in diameter than the shaft and is preferably integral with the shaft. Swiveled on the eccentric portion 41 is an eccentric annulus 42. By the term "eccentric annulus" we mean to bring out the fact that the internal surface of the member 42, indicated at 43, is eccentric relatively to the external bearing surface 44 of the member 42. It follows that the eccentricity of the bearing surface 44, relatively to the axis of the shaft 37, may be varied or adjusted by rotating the

member 42 on the eccentric portion 41 of the shaft.

At one side of the eccentric portion 41 the shaft 37 is formed with an integral collar 45 against which one face of the eccentric annulus 42 seats. This face is formed with a series of spaced tapered holes 46, the centers of these holes being in a circle eccentric with the internal surface 43.

Mounted in the flange 45 and slidable in a direction parallel with the axis of the shaft 37, is a stop pin or indexing pin 47 having a tapered head 48 which when projected by a spring 49 enters and fits closely in one of the holes 46, thus latching the annulus 42 in a definite angular relation to the shaft 37. The member 48 is retractable by a knob 51 and is used merely to secure accurate initial positioning of the annulus 42. When so positioned it is locked to the shaft 37 by a collar extension 52 formed integrally with the annulus 42 and split diametrically as indicated at 53. This split permit the collar to be deformed and clamped tightly upon a portion of the eccentric part 41 of the shaft 37 by means of heavy bolts 54 provided for that purpose. The split collar 52 is formed with two diametrically opposed bosses 55 which are bored at 56 to receive a bar which is temporarily inserted merely to turn the annulus 42 on the eccentric portion 41. To make this adjustment the bolts 54 are, of course, loosened and the tapered bolt 48 is withdrawn.

The purpose of the bolt 48 is not to carry any load, but is merely to insure accurate positioning of the annulus 42 at the time the bolts 54 are tightened. This accurate positioning is necessary because two eccentrics are used, and unless the eccentricity of the two be made identical in the various concurrent adjustment serious wear is inevitable. To accomplish this result the two eccentric structures are counterparts, the angular spacing of the holes 46 being the same on both of the annuli 42 and the location of the tapered bolt 48 being the same on the two collars 45.

Running on the outer bearing surface 44 of each of the annuli 42 is a corresponding eccentric strap 57 whose rod 58 is pivoted at 59 to lugs 61 fast on the upper side of the upper plate 23.

To stop the rotation of the shaft 37 there is provided a brake drum 62 with which there coacts a brake band 63 which may be contracted into braking engagement with the drum by depressing a pedal 64. The pedal 64 is connected to contract the brake band 63 by a linkage of ordinary form.

In operating the machine the plates are appropriately heated as described in the parent application.

The lift cylinders 17 are operated to lift the upper plate 23, the layer of material to be felted is placed on the plate 13, after which

the air lifts 17 are operated to lower the upper plate upon the material. Rotation of the shaft 37 causes the plate 23 to reciprocate in a horizontal direction while resting upon the material, and the effect is to compact and felt the material into a sheet having the desired mechanical properties.

On the completion of the operation the air lifts lift the plate 23 so that the finished sheet may be removed. If at any time it is desired to change the amplitude of reciprocation of the plate 23, the bolts 54 on both eccentrics are loosened, the bolt 47 is retracted and the two eccentric annuli 42 are rotated simultaneously and by the same amount to the desired new position, in which they are again positioned by their respective bolts 48. While so positioned the annuli are clamped in fixed relation upon the shaft 37 by setting up the nuts on the bolts 54.

The device is of simple and rugged construction. The eccentrics may be easily adjusted and when adjusted maintain their adjustment indefinitely.

Obviously various changes in the details of construction may be made and we do not mean to limit ourselves except to the extent specified in the claim.

What is claimed is:

The combination with a felting machine including relatively reciprocable plates, of means for relatively reciprocating said plates with a variable amplitude of reciprocating motion, said means including a rotatable shaft having circular portions eccentric relatively thereto, at least two eccentric annuli rotatable on said eccentric portions to vary the eccentricity of the annuli relatively to the shaft; means for positioning said annuli in similar adjustments including inter-engaging members on the shaft and on said eccentric annuli respectively; means independent of said positioning means for fixing said annuli in said adjusted positions, said independent means comprising split extensions on the annuli and threaded means for contracting said extensions upon the eccentric portions of the shaft; and eccentric straps journaled on said annuli and connected with one of said plates.

In testimony whereof we have signed our names to this specification.

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