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MACHINE FOR EFFECTING KNEADING, CRUSHING, MIXING, AND SIMILAR OPERATIONS

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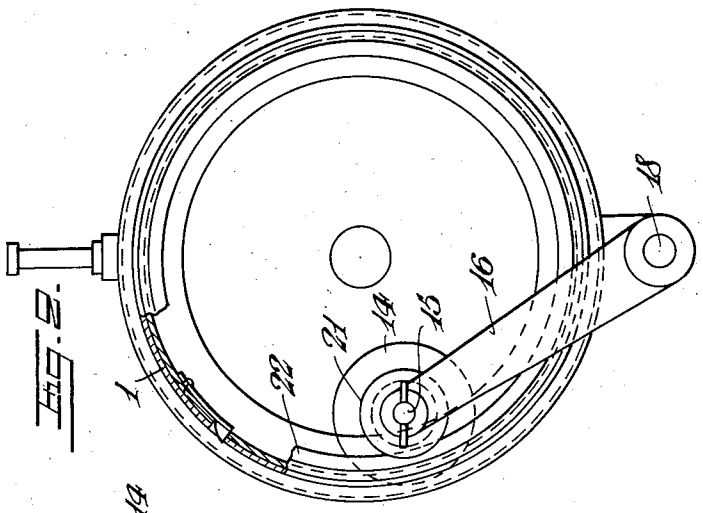

Fig. 2.

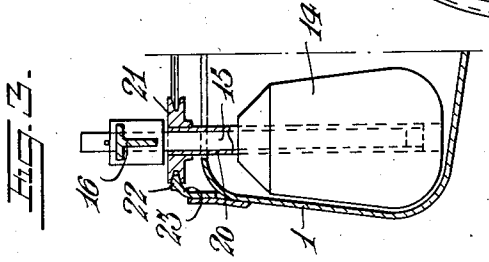

Fig. 3.

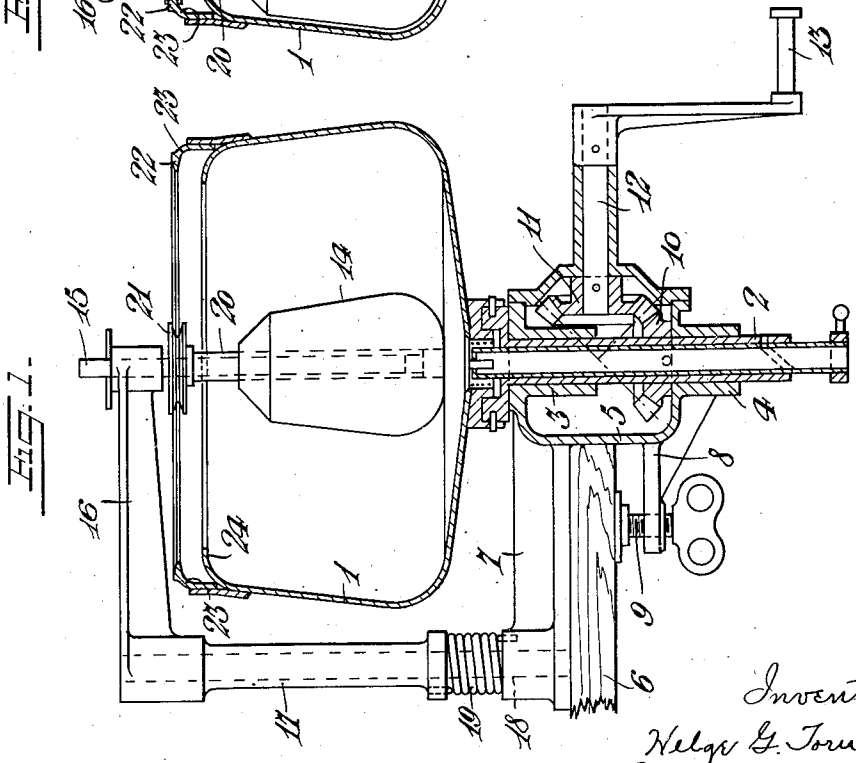

Fig. 1.

Inventors
Helge G. Torulf
Birger Zetterqren,
By Henry Orth Jr atty

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MACHINE FOR EFFECTING KNEADING, CRUSHING, MIXING, AND SIMILAR OPERATIONS

Helge Gustaf Torulf and Birger Zettergren, Stockholm, Sweden; said Zettergren assignor to said Torulf

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1 Claim. (Cl. 259—85)

This invention relates to machines for effecting kneading, crushing, mixing, and similar operations and particularly to that kind of such machines which comprises a rotary receptacle and one or more rollers or the like which are yieldingly pressed against the inner surface of said receptacle and adapted upon the rotation of the receptacle to rotate about separate axes parallel or substantially parallel to the axis of rotation of the receptacle. In machines of this kind as hitherto known the said rotation of the roller or rollers is effected either due to the friction of the roller or rollers against the receptacle or against the material under treatment, or by positive engagement between the roller or rollers and the receptacle, or, finally, by a separate driving mechanism. A well-known form of such a driving mechanism comprises a wedge ring formed at the upper edge of the receptacle and a grooved friction wheel carried by the roller or each roller. With such a driving mechanism it is impossible to prevent, especially in the treatment of liquid material, the material under treatment from coming into contact with said transmission device and become impure.

The invention has for its object to overcome said inconvenience. To this end a transmission device is provided to impart power from the receptacle to the roller or rollers, while being shielded off from the interior of the receptacle.

In the accompanying drawing, one embodiment of the invention is illustrated. Fig. 1 is a vertical section of a machine constructed according to the invention. Fig. 2 is a top plane view of the machine with certain parts removed. Fig. 3 is a vertical section of the transmission device taken at right angles to the section shown in Fig. 1.

An open topped receptacle 1 is removably mounted on a vertical shaft 2 mounted in two bearings 3, 4 which form parts of a casing 5 adapted to be clamped to a table top or the like 6 by means of an upper arm 7 adapted to rest upon the upper side of the table top and a lower arm 8 carrying a clamping screw 9 which may be tightened to engage the lower surface of the table top. The casing 5 contains a pair of bevel gears 10, 11, which connect the vertical shaft 2 to the horizontal shaft 12 of a crank with a handle 13. Provided within the receptacle 1 is a roller 14 which may rotate about a shaft 15 parallel to the shaft 2, that is to say, vertical. Shaft 15 is carried by a horizontal arm 16 projecting from a bushing 17 which is placed on a standard 18 upstanding from the arm 7. Said bushing 17 is acted on by a spring 19 placed around the standard 18 upon arm 7, said spring being so arranged as to cause the arm 16 to hold the roller 14 in engagement with the inner surface of the receptacle. The roller 14 is formed with a hub 20 surrounding the shaft 15 which projects beyond the top of the roller, said hub carrying at its upper end a grooved friction wheel 21 engaging a wedge ring 22 concentric to the axis of rotation of the receptacle, said ring 22 comprising the inwardly directed edge of a flange 23 attached to the receptacle 1 near the top thereof. Below said ring 22 the upper edge portion 24 of the receptacle 1 projects inwardly to such an extent that the opening of the receptacle is of a less great diameter than the opening bounded by the ring 22, so that the engagement of the grooved wheel 21 with said wedge ring 22 will take place at a point shielded off from the interior of the receptacle by said inwardly bent edge portion.

The material to be treated having been placed in the receptacle 1, the latter is caused to rotate. Due to the engagement of the wheel 21 in the ring 22 the roller 14 is caused to rotate about its own shaft 15, while being held in engagement with the inner surface of the receptacle though with a resilient pressure. The material will be treated between the surfaces of receptacle 1 and the roller 14 which both rotate at different peripheral speed. If, during the operation, any portion of the material under treatment would be thrown up so that it comes into contact with the wheel 21 or with the ring 22 and become impure, then said portion of the material cannot again reach the interior of the receptacle to contaminate the material contained therein, because it will be caught by the inwardly bent portion 24 of the receptacle.

The flange 23 which carries or constitutes the wedge ring 22 may either be removably attached to the receptacle in any convenient manner, or it may be permanently attached thereto by riveting, or it may be formed integral with the receptacle. If desired, the wedge ring 22 may be attached to the inwardly bent upper edge portion of the receptacle. In such case, however, a protecting flange should be provided within the receptacle below said edge portion.

The roller may be quite smooth, as indicated in the drawing, or fluted, or partially fluted and partially smooth. It is to be noted that more than one roller may be used in one and the same receptacle.

The transmission device shown may be re-

placed by any other type of power transmission device without departing from the scope or principle of the invention.

What we claim is:—

A machine of the kind described, comprising in combination an open-topped receptacle rotatable about a vertical axis to receive the material to be treated, means to rotate the receptacle, a roller in said receptacle, means carried from outside the receptacle including a shaft depending in the receptacle to rotatably carry the roller, two inwardly extending flanges at the top of the receptacle vertically spaced apart so as to form an annular groove between themselves, the lower flange extending inwardly beyond the upper flange, the uppermost one of said flanges forming a power transmission rim, a power transmission wheel carried by the roller coaxially therewith to engage said rim, and means outside the receptacle to yieldingly press the roller against the inner surface of the receptacle and the transmission wheel against the rim.

HELGE GUSTAF TORULF.
BIRGER ZETTERGREN.