R. D. MADDOX.

MIXING AND GRINDING APPARATUS.

APPLICATION FILED NOV. 26, 1918.

1,301,070.

Patented Apr. 15, 1919.

2 SHEETS—SHEET 1.

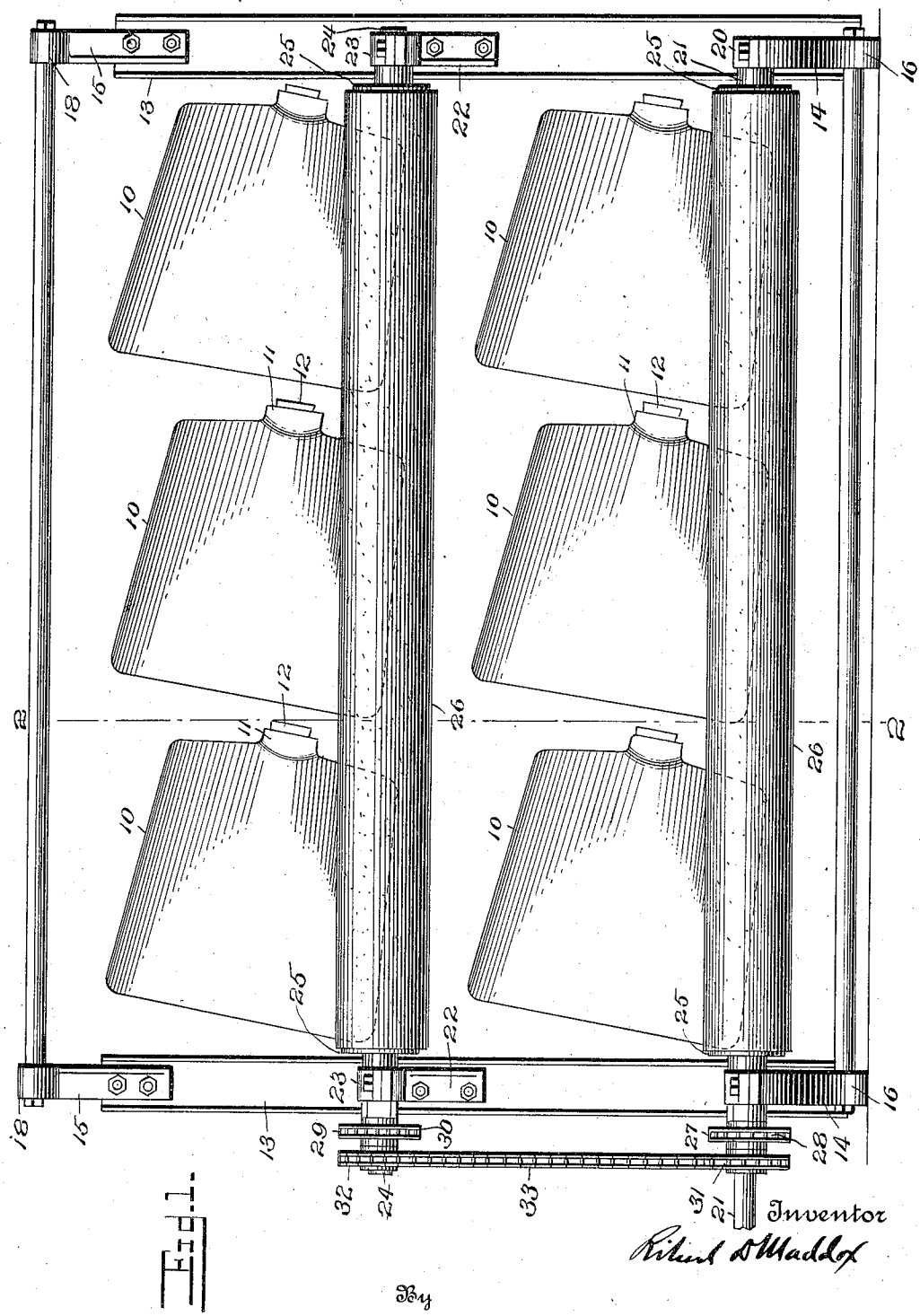


FIG. 1.

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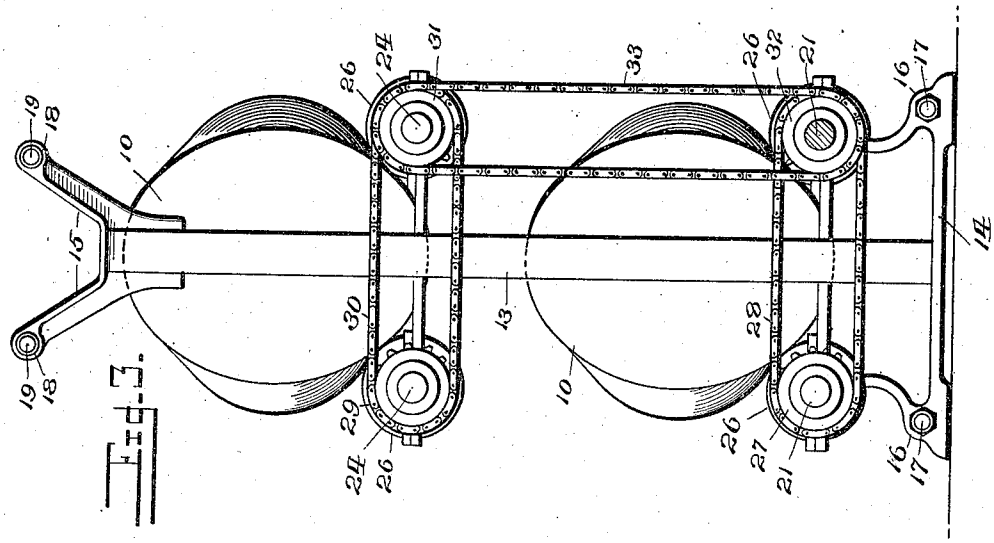


Fig. 1.

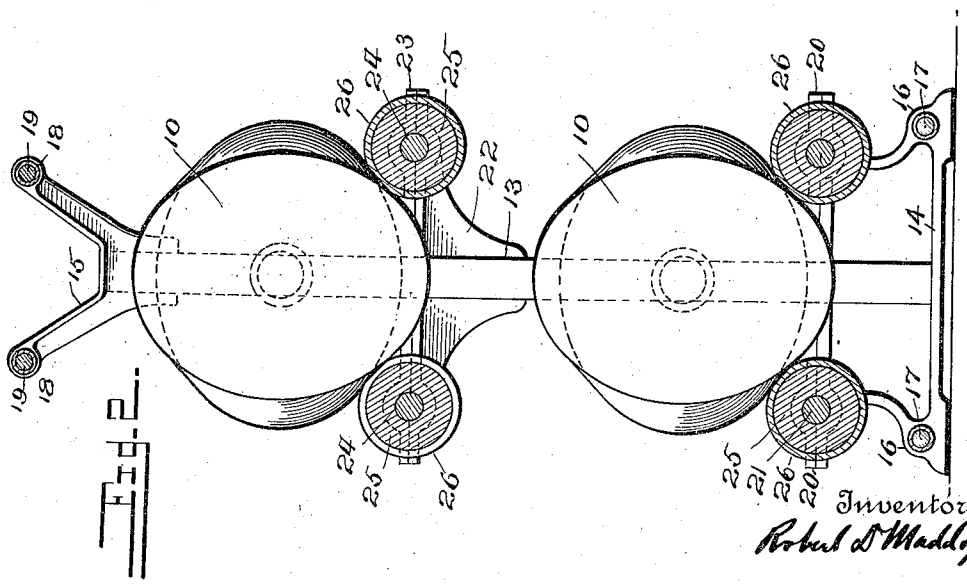


Fig. 2.

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UNITED STATES PATENT OFFICE.

ROBERT D. MADDOX, OF THE UNITED STATES ARMY.

MIXING AND GRINDING APPARATUS.

1,301,070. Specification of Letters Patent. Patented Apr. 15, 1919.

Application filed November 26, 1918. Serial No. 264,228.

To all whom it may concern:

Be it known that I, ROBERT D. MADDOX, major, Med. Dept., United States Army, a citizen of the United States, stationed at Washington, D. C., have invented an Improvement in Mixing and Grinding Apparatus, of which the following is a specification.

The invention described herein may be used by the Government, or any of its officers or employees in prosecution of work for the Government, or by any other person in the United States, without payment of any royalty thereon.

This invention relates to apparatus for mixing, amalgamating, and grinding various substances or compounds, either dry, liquid, or semi-liquid, and has for one of its objects to produce an apparatus whereby the contents of a container may be thoroughly disintegrated and commingled by rotating the container, the latter being mounted upon rotating rollers.

Another object of the invention is to provide a container adapted to rapidly move its contents from end to end while being rotated.

Another object of the invention is to produce a device of this character adapted to support a plurality of independent containers with means for independently rotating them, and so constructed that the containers are loosely supported and adapted to be removed one at a time and replaced by other containers.

With these and other objects in view the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims; and in the drawings illustrative of the preferred embodiment of the invention—

Figure 1 is a side elevation.

Fig. 2 is a transverse section on the line 2—2 of Fig. 1.

Fig. 3 is an end elevation.

The improved apparatus comprises primarily a receptacle for the material or product to be mixed or ground and mounted upon rollers disposed in spaced relation and rotated in the same direction, the receptacle being thus correspondingly rotated and the contents thoroughly mixed and commingled. The receptacles are preferably formed elliptical at the opposite ends with the longer axes at right angles to each other at the ends, or with the longer axis at one end of the receptacle at right angles to the longer axis at the other end, as illustrated. By this arrangement when the receptacles are mounted upon rotating rollers they will be caused to rock or operate unevenly and thus throw the contents backward and forward from end to end of the receptacle, and materially increase the agitation and thoroughly intermingle and mix the same.

The receptacles may be constructed of any suitable material but will preferably be of glass, porcelain lined metal, vitrified ware, lead lined, or otherwise constructed to resist the action of acids or the like. For the purpose of illustration the receptacles, indicated at 10, are each formed with a contracted nozzle or mouth 11, having a suitable stopper indicated at 12, but it is not desired to limit the form of the containers or the material of which they are constructed. The rotating rollers may be of any required length and size and adapted to support any required number of the receptacles. Preferably the rollers will be arranged in pairs one above the other and supported for rotation in a suitable framework. For the purpose of illustration a conventional framework is shown comprising vertical standards 13 of sections of I beams each with a laterally constructed foot or base member 14, and laterally branching head members 15. The base members 14 are provided with bearings 16 through which tie rods 17 are supported, while the head members 15 are provided with bearings 18 to support tie rods 19. The rods 17 and 19 are surrounded by tubular spacing members as indicated in Figs. 2 and 4. By this means the standards 13 are effectually supported in vertical position and in spaced relation. The rotators may be of any required length to correspond to the number of receptacles to be employed.

The base members 14 are formed with bearings 20 to receive the journals of shafts 21. Attached to the standards 13 are bracket devices 22 each carrying a bearing 23 to support the journals of shafts 24. The standards may be of any required height to carry any required number of the brackets, but one set of the brackets only are shown for the purpose of illustration.

The shafts 21—24 support roller devices 25, preferably of wood and each provided with a jacket or covering 26 of suitable yielding material. The yieldable jackets

will preferably be sections of rubber hose stretched over the drums or rollers 25, but may be otherwise constructed, if required.

The shafts 21 are extended at one end to receive chain wheels 27 over which an endless chain 28 is disposed, and the shafts 24 are likewise extended at one end to receive chain wheels 29 over which an endless chain 30 operates. One of the shafts 24 and one of the shafts 21 are further extended to receive chain wheels 31—32 over which an endless chain 33 operates. The shaft 21 which contains the chain wheel 32 is further extended as shown in Fig. 1 to receive the rotating medium, not shown.

It will be obvious by this arrangement that when the last mentioned shaft is rotated by any suitable power the sets of rollers will be simultaneously rotated in the same direction through the action of the chains, and when the receptacles 10 are disposed upon the rollers as shown, the receptacles will be rapidly rotated and cause their contents to be thoroughly mixed, ground, or commingled, as before described, and thrown from end to end at the same time.

The receptacles being disposed loosely upon the rollers can be removed one at a time and replaced by other receptacles without disturbing the remaining receptacles. Thus compounds or material of various kinds may be operated upon at the same time and the contents of the various receptacles separately retained.

The improved device may be employed for grinding or mixing various substances either powdered, liquid or semi-liquid, as may be required, and will be found of special advantage in grinding or mixing lymph or compounds employed in vaccination or inoculations of various kinds. The device may be arranged for relatively large containers and likewise be employed for mixing concrete, clay and like material or compounds.

Having thus described the invention what is claimed as new is—

1. In an apparatus of the class described, a container elliptical at its opposite ends and with the major axes of the elliptical portion at angles to each other and the side walls continuous from end to end, rollers supporting the containers and in constant contact with the elliptical surfaces thereof, and means for rotating the rollers.

2. In an apparatus of the class described, rollers disposed in spaced relation, means for simultaneously rotating said rollers in the same direction, and a container resting by its side walls upon said rollers and rotated thereby, said container being elliptical at its opposite ends with the major axes of the elliptical portions at angles to each other.

3. In an apparatus of the class described, a container elliptical at its opposite ends and with the major axes of the elliptical portions at angles to each other and the side walls continuous from end to end.

4. In an apparatus of the class described, a support including vertical standards in spaced relation, means for connecting said standards, a plurality of brackets connected to said standards at opposite sides and including shaft bearings, rollers having journals engaging in said bearings, means for rotating each pair of said rollers in the same direction, and a container resting upon each pair of said rollers and rotated thereby, said container being elliptical at its opposite ends with the major axes of the elliptical portions at angles to each other.

ROBERT D. MADDOX.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."