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AUTOMATIC BLOOD MIXING MACHINE

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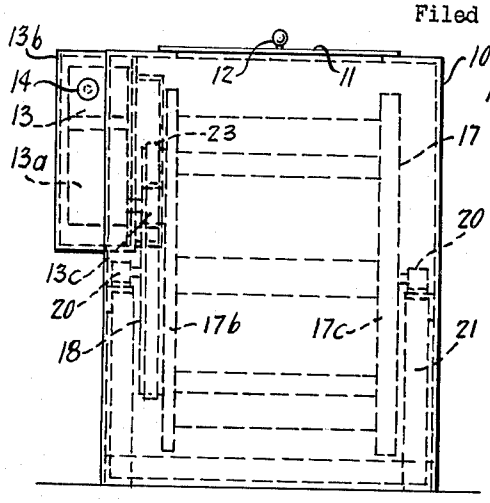


FIG. 1

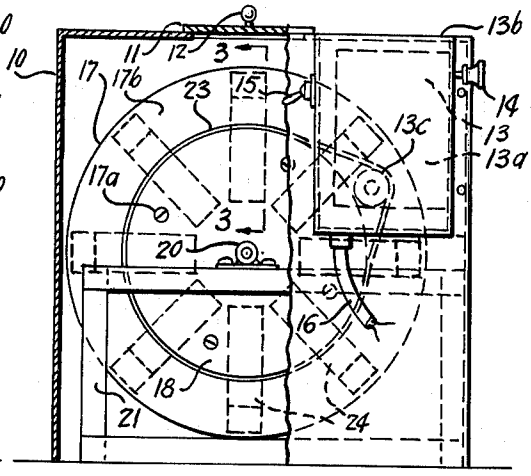


FIG. 2

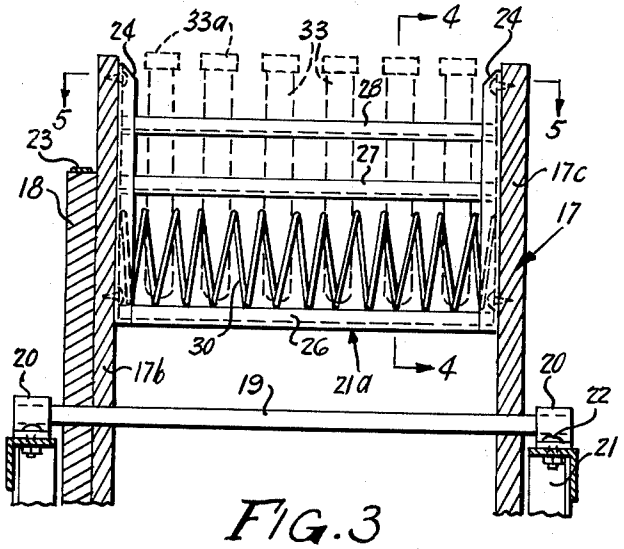


FIG. 3

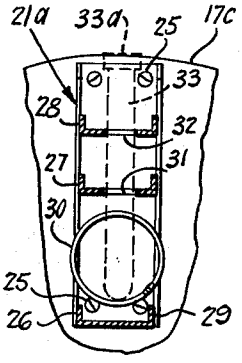


FIG. 4

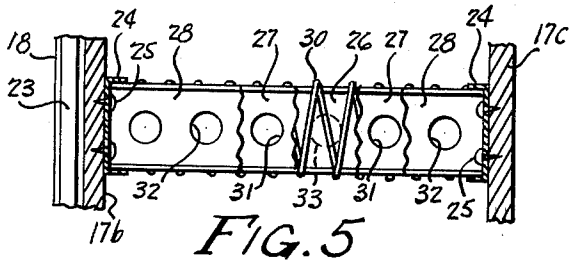


FIG. 5

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AUTOMATIC BLOOD MIXING MACHINE

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This invention relates to improvements in blood mixing machines, and in particular, to the self-powdered and automatic type of revolving machine.

Blood consists of a fluid called plasms, in which are carried three vital kinds of cells, called corpuscles: red cells, white cells, and platelets. The red corpuscles (erythrocytes) carry hemoglobin, which combines with oxygen; they also carry various chemicals and fats. The white corpuscles (leucocytes) include a number of different kinds of cells, whose main task is to surround and destroy harmful cells, germs and the like. The chief known purpose of the platelets (thrombocytes) is to enable the blood to clot when necessary to prevent bleeding when the body is cut or injured.

In order to keep blood plasma, when stored, from deteriorating it is necessary to keep the plasma constantly mixed and balanced in proportion of ingredients as nearly as possible to that found in its habitat, the human body.

The instant new machine solves the above problem by keeping blood plasma gently and properly mixed in such desired proportions of ingredients by a rotary tumbling motion accompanied by a flexible spring absorbent reaction to any sudden and violent tumbling mixing action of the machine on the blood plasma.

The primary object of the instant invention is to provide a machine to reliably and efficiently keep blood plasma properly mixed and balanced in proportion to its existing ingredients, when stored, to prevent deterioration of the plasma.

Another object of the invention is to provide an automatic mixing machine capable of properly mixing blood plasma for prolonged periods of time without attendance of an operator.

A further object of the invention is to provide an automatic mixing machine capable of properly mixing stored blood plasma which is simple to service, operate and economical to manufacture.

With these and other objects in view, the invention includes certain novel features hereinafter described with reference to the drawings which accompany and form a part of this specification.

In the drawings:

FIGURE 1 is an end view in elevation of the new machine in a dust proof enclosure supporting a housed motor and gear reduction unit thereon;

FIGURE 2 is a partial sectional side view of the inventive mixing machine in elevation;

FIGURE 3 is a part sectional view of the rotor and side pulley of the invention;

FIGURE 4 is a sectional view of one of the multiple test tube rack holders including common helical spring means of the new machine taken on lines 4—4 of FIGURE 3 in the direction of the arrows; and

FIGURE 5 is a sectional view of FIGURE 3 taken on lines 5—5 in the direction of the arrows.

Referring now to the drawings, wherein like reference numerals designate like parts, FIGURES 1 through 5 illustrate a preferred embodiment of the invention.

FIGURES 1 and 2 disclose the dust proof housing **10** having an access lid **11**, knob lift means **12**, motor means **13** and gear reduction means **13***a* in housing means **13***b*, conventional variable gear speed regulation means **14**, and energizing electrical switch means **15**. Electrical cable means **16** terminates in a suitable plug connection (not shown) for engaging any energized and suitable electrical outlet receptacle, thereby energizing the conventional electrical motor means **13** in housing means **13***b*. Gear reduction means **13***a* is operably connected to belt means **23** at **13***c* as shown in FIGURE 2.

FIGURE 3 discloses a sectional portion of rotary drum means **17** connected by screw means **17***a* or other suitable means to belt disc pulley means **18**, both of which are suitably mounted on shaft means **19** carried by conventional horizontal bearing means **20** secured to support structural means **21** by bolt means **22**. Between the two disc side portions **17***b* and **17***c* of drum means **17** are radially mounted by screw means **25** a plurality of carrying brackets **24** for rack means **21***a* attached thereon as shown.

Each pair of oppositely disposed brackets **24** are interconnected by a base plate means **26**, intermediate plate means **27**, and upper plate means **28** by solder means **29** or other suitable means as shown. Helically coiled spring means **30** is mounted between the oppositely disposed brackets **24** juxtaposed to base means **26**. Spring means **30** may be secured at each end by screw means **25** or other suitable means.

FIGURES 4 and 5 disclose a plurality of test tube openings **31** and **32** in intermediate plate means **27** and upper plate means **28**, respectively, to receive a plurality of test tubes **33** having closure means **33***a*, as shown in broken lines in FIGURES 3 and 4.

In use test tubes **33** with cap enclosures **33***a* are placed in aligned openings **32** and **31** of upper plate means **28** and intermediate plate means **27**, respectively, allowing the lower portion of test tube **33** to be flexibly secured in helical spring means **30** as shown in FIGURES 3 and 4. Then switch means **15** is closed to energize the variable speed motor means **13** inside housing **13***b* which actuates reduced gear means and turns pulley means **13***c* to actuate belt means **23** which rotates pulley means **18** and drum means **17** at a desired and consistent rotary speed, mixing and balancing the plasma ingredients in proper proportions to prevent deterioration of blood plasma.

From the foregoing it will now be seen that there is herein provided an improved blood mixing machine which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

It should be understood, of course, that the foregoing disclosure relates to only a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention set forth in the appended claim.

We claim:

An automatic mixing machine of the character described comprising a casing, a shaft mounted in fixed

position in said casing, a pair of spaced similar disks rotatably mounted on said shaft, and a plurality of annularly spaced radially extending similar racks secured to and between said disks; a pulley secured to the outer face of one of said disks; power means, and means operatively connecting said pulley to said power means through which said disks and the said racks secured to and between said disks are adapted to be rotated in unison by said power means; each of said racks comprising a pair of opposed radially extending brackets each of which is secured to the inner face of each of said disks, an elongated rectangular base plate secured to and between said brackets adjacent the lower ends thereof, an elongated rectangular upper plate having a plurality of spaced apertures therein secured to and between said brackets adjacent the upper ends thereof, an elongated rectangular intermediate plate having a plurality of spaced apertures therein secured to and between said brackets intermediate said base and upper plate with the said apertures therein disposed in alignment with the said apertures in said upper plate, and a transversely extending helically coiled spring which is disposed between said base and intermediate plates and is secured to and between said brackets; the aligned apertures in said upper and intermediate plates being adapted to have elongated containers removably mounted therein with the lower ends of said containers frictionally gripped between adjacent convolutions of said helically coiled spring.

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