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MEANS FOR SPREADING DISKS

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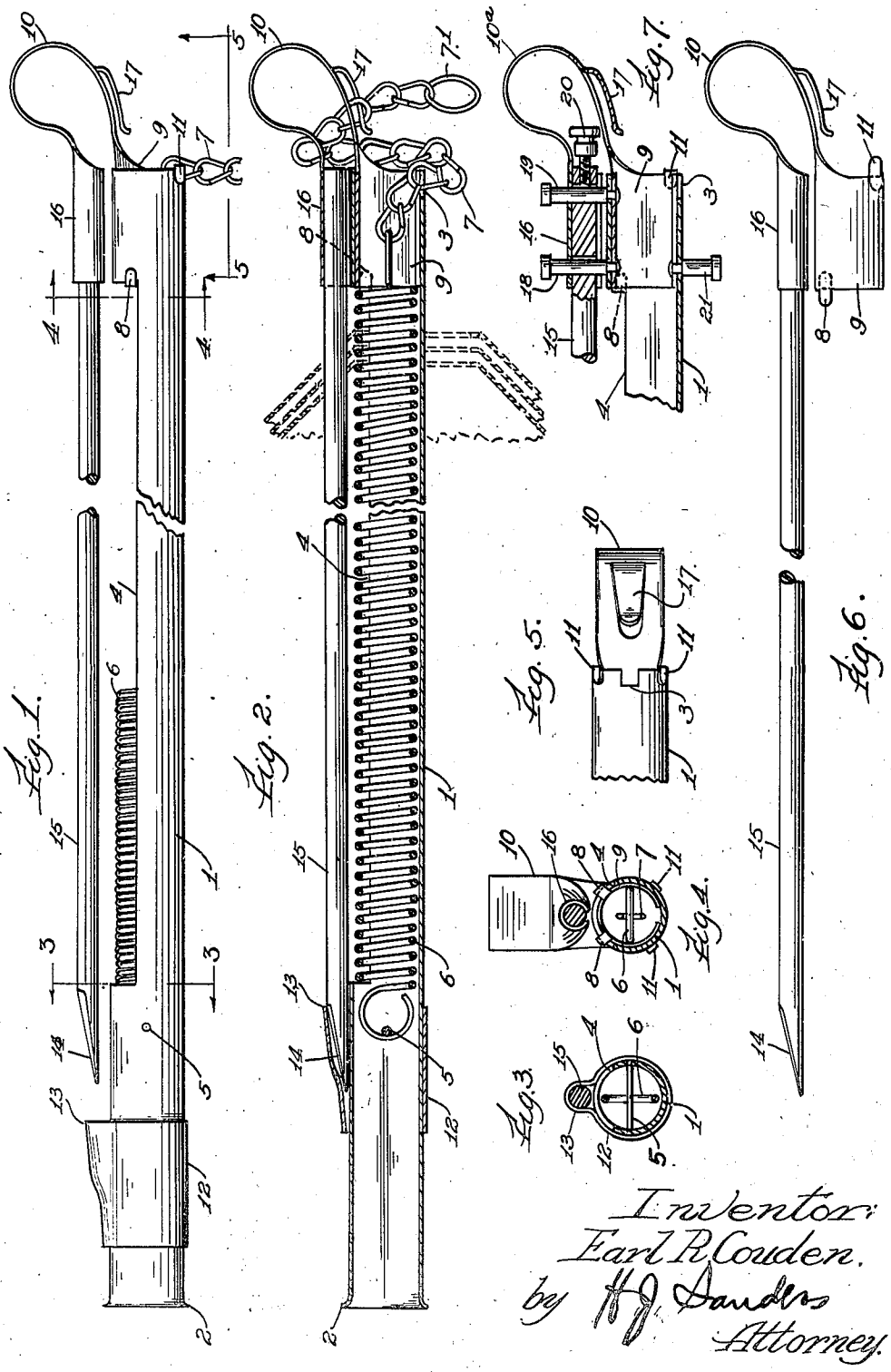


Fig. 1.

Fig. 2.

Fig. 7.

Fig. 5.

Fig. 6.

Fig. 4.

Fig. 3.

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MEANS FOR SPREADING DISKS

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5 Claims. (Cl. 141—1)

This invention relates to means for separating disks to condition them for cleaning and more particularly to disks of cream separators which generally are centrally apertured and of frusto conical form permitting the disks to nest. This application may be considered a further development of my Patent No. 2,244,611, dated June 3, 1941.

One of the objects of the present invention is in the provision of disk separating means which when actuated function to separate the nested disks automatically so that skill or previous experience on the part of the operator is unnecessary.

A further object is to provide mechanism for separating disks that is of few parts, inexpensive to manufacture, not likely to get out of order, that is "fool-proof" in operation and durable and efficient in use.

A further object is to provide disk spreading means that can be readily used with all popular makes and sizes of cream separators using frusto conical disks, serving to spread and hold the disks apart so that the cleaning solution may function properly and thereafter permit rinsing and airing or drying of the disks, the disks thereafter being readily discharged from the separator by the operator.

While the present invention was devised for use more particularly in connection with the cleaning of cream separator disks it is not to be limited to such use and may be utilized in connection with other disks.

With the foregoing and other objects in view the invention consists in the combination and arrangement of parts to be hereinafter fully described, pointed out in the claims and illustrated in the accompanying drawing, wherein—

Fig. 1 is a view in side elevation of a device embodying the present invention, with a portion of the structure broken away.

Fig. 2 is a sectional longitudinal central view of Fig. 1 with adjustable parts in an altered position and illustrating the application of the device.

Fig. 3 is a vertical cross sectional view through Fig. 1 on the line 3—3, looking in the direction indicated by the arrows.

Fig. 4 is a view similar to Fig. 3, taken on the line 4—4 of Fig. 1 and looking in the opposite direction as denoted by the arrows.

Fig. 5 is a fragmentary bottom plan view of Fig. 1 taken on the line 5—5 thereof and looking upwardly or in the direction of the arrows.

Fig. 6 is a fragmentary view of Fig. 1, and

Fig. 7 is a longitudinal sectional view of a modified form of the device.

Like reference characters denote corresponding parts throughout the several views.

The reference numeral 1 denotes a cylindrical tube open at both ends, one end being formed with a flange 2 and the opposite end with a notch 3, and with an elongated slot 4 reaching short of the tube ends. Extending transversely of the tube 1 and spaced from the adjacent end of the slot 4 is a pin 5 to which one end of the contractile coil spring 6 is secured that extends longitudinally of the tube, the convolutions of said spring extending into the slot 4 for the purpose of spreading the disks. The end of said spring remote from the pin 5 is engaged by a chain 7 provided terminally with a ring 7'. Normally the spring 6 extends lineally somewhat less than one half the length of the slot 4 but by means of said chain 7 it may be expanded to occupy the entire length of said slot, the chain extending out the adjacent or non-flanged end of the tube 1. The diameter of the spring is such as to permit it to fit snugly inside the tube with freedom of expansion and contraction, one terminal convolution in the expanded position of the spring being adapted to contact the prongs 8 formed upon the lower substantially tubular end 9 of the hook 10 to form a stop for said spring, said prongs being bent rearwardly into engagement with the tube 1 at the end of the slot 4.

Similar prongs 11 of the end 9 are bent in the opposite direction into engagement with the end of the tube, the prongs 8 and 11 securing said hook 10 fast to the tube 1. Slidably secured to the tube 1 between the pin 5 and flange 2 is the sleeve 12 retained against removal from the tube at one end by said flange 2, said sleeve being formed with a flute 13 in line with the slotted portion of the tube to receive the beveled end 14 of the floating guide rod 15 extending longitudinally of said tube immediately above the slotted portion thereof and received terminally in the upper tubular end 16 of said hook 10. The said hook is made preferably of resilient material throughout so that its upper end is spaced yieldingly above the tube 1, said hook being formed with a clip 17 with its free open end disposed inwardly or toward the tube 1.

In operation the disks to be spread are placed upon the spreader while the same is in the position shown in Fig. 1, the tube 1 being introduced into the large central disk perforations, flanged end first, the sleeve 12 being free from the rod 15 and the beveled end 14 being disposed in the small

off-center disk perforations. The sleeve 12, flanged end of tube 1 and the beveled end of the rod 15 are now all clear of all disks and the disks rest upon said rod and tube and also upon the spring 6. The sleeve 12 is now moved into engagement with the rod 15, the fluted end 13 receiving the beveled end 14 of said rod and forcing the same toward the tube and holding the disks in the convolutions of the spring 6 positively. The spring is now expanded by pulling the chain 7 outwardly and since the disks are received in the spring convolutions the expansion of the spring spreads the disks apart.

One link of the chain is now disposed in the notch 3 in the tube and the spring is held in expanded position, the chain being now wrapped about the hook 10, as shown in Fig. 2, one chain link being then placed in engagement with the clip 17, the chain now pressing the end 16 of the hook and the floating rod toward the tube and further tending to hold the disks in position. The spreader with the separated disks may now be immersed in a container having the cleaning fluid and moved about to effect the disk cleansing and thereafter the spreader may be withdrawn and hung up by the chain or hook to dry and air.

To remove the disks from the spreader the sleeve is manually moved along the tube 1 out of engagement with the end of the guide rod. The spreader is now partially rotated about its longitudinal axis so that the floating guide rod is beneath the tube. The guide rod will then drop slightly away from the tube and with the flanged end of the tube inclined downwardly somewhat, the discs will readily slide off the spreader. The chain may now be unwrapped from the hook 10 and withdrawn from the tube-notch 3 and from clip 17 to permit the spring to contract, ready for the next operation.

Referring now to Fig. 7 the upper end of the hook 10*a* is provided with a stud 18 and pin stud 19 both of which extend through the hook and through the rod 15 and into the tube 1 wherein both are riveted, the pin stud being formed with a roughened surface for frictional engagement with the pointed end of the locking screw 20 carried at the end of said guide rod to frictionally lock said rod with relation to said pin stud when desired. The stud 18 serves to yieldingly retain the floating rod 15 in position substantially parallel to the tube. Carried by the tube 1 upon the opposite side thereof with relation to the stud 18 is a stop pin 21 riveted to the tube that serves to prevent the disks from moving therebeyond in a direction toward the handle or hook 10*a*.

The disks are introduced upon the tube 1 as previously described, the screw 20 being loosened and the guide-rod disengaged from the sleeve and inserted in an off-center perforation of each disc. The guide rod and sleeve are now again engaged and the screw 20 tightened. The disks may now be washed and thereafter may be removed after again loosening screw 20, disengaging the sleeve and guide rod and inverting the spreader. The spring after receiving the disks between convolutions, as previously described, serves as it is fully expanded to space the disks well apart as shown in Fig. 2 in which position they are positively retained by the chain about the hook which presses the rod 15 against the walls of the off-set disk perforations, this position of the parts admitting the cleansing fluid freely between the disks

What is claimed is:

1. Mechanism for spreading disks having apertures therein comprising a supporting member to extend through apertures in the disks and along which the disks are movable, said member being notched, a coil spring terminally anchored within said member for receiving the disks between its convolutions, a resilient hook at the notched portion of said member formed with a tubular free end, prongs connecting said hook to said member, a floating guide rod carried by said hook end in yielding spaced relation to and extending longitudinally of said supporting member and through other apertures in the disks, a sleeve slidably arranged upon said supporting member for binding engagement with and disengagement from said guide rod, and a chain engaging said coil spring and extending beyond said supporting member for expanding said spring and for engagement with the notched portion of said member.

2. Mechanism for spreading disks having apertures therein comprising a tubular supporting member to extend through apertures in the disks and along which the disks are movable, said member being notched at one end and flanged at the opposite end, a coil spring arranged in said tubular member for receiving the disks between its convolutions, said spring being anchored at the other end, a resilient hook at the notched end of said supporting member, the ends of said hook being tubular, one end being received in the notched end of said supporting member and the opposite end disposed outside said supporting member, prongs connecting the inner tubular hook end to said supporting member, said prongs serving as stop members for said coil spring in one position thereof, a floating guide rod carried by said hook in yielding spaced relation thereto and extending longitudinally of said supporting member and through other apertures in the disks, a sleeve slidably arranged upon said supporting member for binding engagement with and disengagement from said guide rod, and a chain connected to said coil spring for expanding same and for anchoring engagement with the notched portion of said supporting member and for disposal about said hook.

3. Mechanism for spreading disks having apertures therein comprising a supporting member to extend through apertures in the disks and along which the disks are movable, said member being notched, a terminally anchored coil spring associated with said member for receiving the disks between its convolutions, a hook at one end of said supporting member, a stop stud connecting said hook and supporting member, a floating guide rod carried by said hook in yielding spaced relation to said supporting member and extending through other apertures in the disks, studs connecting one end of said guide rod to said hook and supporting member, one of said studs having a roughened exterior, a locking screw releasably connecting said guide rod and said roughened stud, prongs connecting said hook and supporting member and serving as a stop for said coil spring in the extended position thereof, a clip carried by said hook, a sleeve slidable upon said supporting member for binding engagement with and disengagement from said guide rod, and a chain connected to said coil spring for expanding same and for anchor engagement with the notch in said supporting member and for disposal about said hook and anchor engagement with said clip.

4. Mechanism for spreading disks having apertures therein comprising a supporting member to extend through apertures in the disks and along which the disks are movable, disk-engaging and

actuating means carried by said supporting member adjustable relative thereto to space said disks apart, said means adapted to be locked in selective position relative to said supporting member, a floating guide rod extending through other apertures in the disks, resilient connection between one end of said guide rod and said supporting member, and a sleeve adjustably carried by said supporting member for cooperation with the other end of said guide rod.

5. Mechanism for spreading disks having apertures therein comprising a supporting member to extend through apertures in the disks and along which the disks are movable, disk-engaging and actuating means carried by said supporting member and adjustable relative thereto to space said disks apart, a guide rod extending through other apertures, resilient connection between one end of said guide rod and said supporting member, a pin stud connecting said guide rod and resilient connection to said supporting member, a locking screw carried by said guide rod engaging said pin stud, and a sleeve slidable upon said supporting member for cooperation with the other end of said guide rod.

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