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(54) **Lens grinding apparatus**

Vorrichtung zum Schleifen von Brillengläsern

Dispositif de meulage de verres de lunettes

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Description

BACKGROUND OF THE INVENTION

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a lens grinding apparatus having a grinding water storage vessel.

PRIOR ART

[0002] In a conventional apparatus for treatment of grinding water for use in a lens grinding apparatus, (hereinafter referred to as "grinding water treating apparatus"), a grinding water treating means which filters grinding water after used in a glasses lens grinding work to separate grinding wastes and produce purified water and a deodorizing means for removing an offensive smell developed in the grinding water treating means and also developed in a grinding water storage vessel, are disposed within different housings respectively.

[0003] A housing which contains therein the grinding water treating means, a housing which houses therein the deodorizing means, as well as a space present above the grinding water storage vessel and a housing with the deodorizing means disposed therein, are interconnected through hoses or pipes. In this case, an offensive smell is removed through hoses or the like which connect the housings.

[0004] In the above grinding water treating apparatus, since the grinding water treating means and the deodorizing means are disposed in different housings, the size of the grinding water treating apparatus becomes large, thus giving rise to the problem that it is difficult to accommodate the apparatus within a limited receptacle space.

[0005] On the other hand, when the grinding water flowing into the grinding water storage vessel mixes into the grinding water already stored in the grinding water storage vessel, there sometimes occurs a case where foams are formed.

[0006] To extinguish foams developed on the surface of the grinding water stored in the grinding water storage vessel, there are known a lens grinding apparatus having a defoaming device which injects grinding water containing a defoaming agent toward the foams in the form of spray (shower) to remove the foams, a lens grinding apparatus having a defoaming device which injects pressurized grinding water upward from below the level of already-stored grinding water with use of an injection nozzle connected to the grinding water storage vessel, a lens grinding apparatus having a foam suction means which sucks the foams developed on the surface of grinding water, and a lens grinding apparatus wherein a foam overflow path for overflowing the foams developed on the grinding water surface is provided in the grinding water storage vessel.

[0007] However, there sometimes has occurred a case where grinding wastes contained in grinding water which

has been used in grinding a glasses lens adhere to the foams developed and harden in the form of cluster.

[0008] Consequently, it is difficult to crush or suck the foams once clustered or cause them to flow out, with consequent occurrence of the problem that the foams cannot be extinguished to a satisfactory extent.

[0009] DE 43 36 824 A shows a lens grinding apparatus comprises grinding water storage vessel for the storage of grinding water including a grinding waste, which has been used in grinding a glasses lens, and a grinding water supply hose which permits the grinding water to flow into the storage vessel via an injection bell which is immersed with its open side into the grinding water in the storage vessel. A nozzle plate in the upper part of the bell distributes the supplied grinding water which drops within the bell on foam formed on the grinding water in the storage vessel and destroys it.

[0010] Further, PATENT ABSTRACTS OF JAPAN vol. 2000, no. 02, 29 February 2000, & JP 11 320 408 A disclose a lens grinding apparatus, wherein purified grinding water, mixed with a defoaming agent, is guided to a spray nozzle and sprayed on the surface of waste grinding water stored in a drain tank. Foams which are generated on the waste grinding water are defoamed by the sprayed purified grinding water and the defoaming agent contained in it.

SUMMARY OF THE INVENTION

[0011] The present invention has been accomplished in view of the above mentioned problems in the conventional apparatuses and it is an object of the present invention to provide a lens grinding apparatus capable of suppressing the formation of foams when grinding water flowing into a grinding water storage vessel mixes into grinding water already stored in the vessel.

[0012] According to the present invention, for achieving the foregoing object, there is provided a lens grinding apparatus having a grinding water storage vessel for the storage of grinding water including a grinding waste, which has been used in grinding a glasses lens, and a grinding water supply hose which permits said grinding water to flow into said grinding water storage vessel, wherein an injection nozzle is attached to a tip of said grinding water supply hose, and said grinding water is injected radially by said injection nozzle to cover the surface of grinding water already stored in said grinding water storage vessel, thereby preventing foams from being produced on the surface of said grinding water in said grinding water storage vessel when said grinding water flows into said grinding water storage vessel.

FIG. 1 is an explanatory piping diagram showing schematically a lens grinding apparatus and a grinding water treating apparatus according to an embodiment of the present invention; and

FIG. 2 is an enlarged explanatory diagram of a lens

grinding apparatus according to the embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0013] The preferred embodiment of the present invention will be described in detail with reference to the accompanying drawings hereinafter.

<Construction>

[0014] In FIG. 1, the numeral 1 denotes a lens grinding apparatus, numeral 2 denotes an apparatus support base for supporting the lens grinding apparatus 1, and numeral 3 denotes a grinding water tank (grinding water storage vessel) disposed under the apparatus support base 2. With a partition filter 23, the interior of the grinding water tank 3 is partitioned into a purified grinding water chamber (purified water chamber) 3a and a discharged grinding water chamber (waste water chamber) 3b.

[0015] In the purified grinding water chamber 3a is disposed a purified water recycle pump 24, while in the discharged grinding water chamber 3b is disposed a discharged grinding water pump 25. A discharge side of the purified water recycle pump 24 and a grinding water supply nozzle (not shown) disposed within the lens grinding apparatus 1 are connected together through a purified grinding water supply hose 26.

[0016] In the lens grinding apparatus 1, a grinding wheel (not shown) is rotated at high speed to grind a lens to be ground (unground circular glasses lens) into a glasses lens shape (globe shape).

[0017] In this grinding work, purified water present within the purified grinding water chamber 3a is pumped up by the purified water recycle pump 24 and is fed through the purified grinding water supply hose 26 to the nozzle (not shown) disposed within the lens grinding apparatus 1, then is fed from this nozzle to a lens grinding section using the grinding wheel to cool the grinding section and wash away grinding wastes. As a construction for such a grinding work there is used a known one, so a detailed description thereof will here be omitted.

[0018] Grinding water ("discharged grinding water" hereinafter) after thus washing away of grinding wastes is allowed to flow down together with the grinding wastes into the discharged grinding water chamber 3b in the grinding water tank 3 from a bottom of the lens grinding apparatus 1 through a grinding water discharge hose (grinding water supply hose) 19.

[0019] Sideways of the apparatus support base 2 is disposed a grinding water treating apparatus 27 which is installed on a support base (housing) 28 with caster. As will be described later, the grinding water treating apparatus 27 is provided with a grinding water treating means which filters discharged grinding water to separate grinding wastes and produce purified grinding water ("purified water" hereinafter) and a deodorizing means

for removing an offensive smell developed within the grinding water treating means, etc.

[0020] A grinding water treating section (grinding water treating means) 27a has a bottomed cylindrical separating vessel body (pressure-resistant vessel) 9 and a bottomed cylindrical grinding wastes separating filter (one-pass means) 10 disposed within the separating vessel body 9. The grinding water treating section 27a is also provided with a lid 11 which closes an upper-end opening of the separating vessel body 9, a packing 12 interposed between the lid 11 and the upper end of the separating vessel body 9, fixing screws 13 which fix the lid 11 to the separating vessel body 9, and a lever 14 for performing the fixing operation of the fixing screws 13 and cancelling the same operation.

[0021] The grinding water treating section 27a is further provided with a feed port 15 connected to the upper end portion of the separating vessel body 9 and a drain port 16 provided in a lower portion of the separating vessel body 9.

[0022] An opening/closing valve (not shown) is provided in each of the feed port 15 and drain port 16. Numerals 15a and 16a denote open/close operating lever for the opening/closing valve (not shown) in the feed port 15 and drain port 16.

[0023] One end of a grinding water discharge hose 30 is connected to a discharge port (not shown) of the grinding water discharge pump 25, while an opposite end of the grinding water discharge hose 30 is connected to the feed port 15 removably with use of a connector or a screw.

[0024] On the other hand, one end of a purified water recycle hose 31 is connected to the drain port 16 removably with use of a connector or a screw and an opposite end thereof is held in an upper portion of the purified grinding water chamber 3a in the grinding water tank 3 removably with use of a connector or a screw. As fixing means for the connector or screw there may be used a known connector or nut used for the connection of hose.

[0025] Further, the deodorizing means has a deodorizing device disposed under the separating vessel body 9.

<Operation>

[0026] Next, a description will be given below of the operation of the lens grinding apparatus 1 and the grinding water treating apparatus 27 both constructed as above.

50 Washing Away Grinding Wastes in Grinding Work

[0027] In the above construction, the opening/closing valves (not shown) disposed in the feed port 15 and the drain port 16 are opened by operating the open/close operating levers 15a and 16a and in this state a grinding wheel (not shown) in the lens grinding apparatus 1 is rotated at high speed to grind a to-be-ground lens into a glasses lens shape (globe shape).

[0028] At this time, purified water present within the purified grinding water chamber 3a in the purified water tank 3 is pumped up by the purified water recycle pump 24 and is fed through the purified grinding water supply hose 26 to the nozzle (not shown) disposed within the lens grinding apparatus 1, then is fed from the nozzle to the lens grinding section using the grinding wheel to cool the grinding section and wash away grinding wastes.

[0029] The purified water after thus washing away of grinding wastes becomes discharged grinding water and is allowed to flow down together with the grinding wastes from the bottom of the lens grinding apparatus 1 into the discharged grinding water chamber 3b in the grinding water tank 3 through the grinding water discharge hose 19.

Separating Grinding Wastes (Grinding Water Treatment)

[0030] In such a grinding work, the grinding water discharge pump 25 sucks the discharged grinding water from the interior of the discharged grinding water chamber 3b in the grinding water tank 3 together with grinding wastes and supplies the discharged grinding water containing the grinding wastes into the grinding wastes separating filter 10 through the grinding water discharge hose 30 and the feed port 15. A single pump may be used in common to both purified water recycle pump 24 and grinding water discharge pump 25.

[0031] The discharged grinding water is separated from the grinding wastes by the grinding wastes separating filter 10 and becomes purified water, which is returned into the purified grinding water chamber 3a in the grinding water tank 3 through the drain port 16 and the purified water recycle hose 31. At this time, the grinding wastes separating filter 10 collects the grinding wastes contained in the discharged grinding water.

Discarding Grinding Wastes

[0032] When the grinding wastes are collected to a certain extent by the grinding wastes separating filter 10 and the amount of the discharged grinding water filtered by the grinding wastes separating filter 10 decreases, the purified water recycle pump 24 and the grinding water discharge pump 25 are turned OFF and thereafter the lever 14 is operated to cancel the fixed state of the lid 11 to the separating vessel body 9 by the fixing screws 13.

[0033] Subsequently, the lid 11 is removed from the separating vessel body 9, the grinding wastes separating filter 10 is taken out from the interior of the separating vessel body 9, and the grinding wastes collected in the filter 10 are discarded. Then, the filter 10 is returned to the separating vessel body 9 and the vessel body 9 is closed with the lid 11 by reversing the above operation, thereafter, the fore-going "grinding work" and "grinding water treatment" are allowed to proceed. Subsequently, such a grinding water-grinding wastes separating work

is performed repeatedly.

[0034] In such a grinding water treatment, if the discharged grinding water filtering capacity of the grinding wastes separating filter 10 is deteriorated, the grinding wastes collected by the grinding wastes separating filter 10 may be discarded as described above after squeezing out purified water from the grinding wastes by the air compressor (pressurizing means) (not shown) and subsequent drainage thereof from the drain port 16.

Discarding Grinding Water

[0035] If the purified water is somewhat turbid even after the application of such a grinding water treatment, there may be adopted a method involving removing the purified water recycle hose 31 from the grinding water tank 3, connecting the hose 31 to a sewer (not shown), and carrying out the foregoing grinding water treatment, whereby purified water free of grinding wastes can be discarded to the sewer. Alternatively, there may be adopted a method wherein the purified water recycle hose 31 is disconnected from the drain port 16, while a drain hose (not shown) connected to the sewer is attached to the drain port 16, and the foregoing grinding water treatment is carried out, thereby allowing turbid purified water free of grinding wastes to be discharged to the sewer.

[0036] According to Fig. 2 an injection nozzle N as injection means is attached to a tip 19a of the grinding water discharge hose 19 to inject the discharged grinding water radially.

[0037] The surface of discharged grinding water pre-stored in the discharged grinding water chamber 3b of the grinding water tank 3 can be covered with the discharged grinding water which is injected through the injection nozzle N, and thus foams produced on the surface of the discharged grinding water can be extinguished.

[0038] A divergence angle θ of the discharged grinding water injected by the injection nozzle N is in the range of 120° to 180° . The divergence angle θ can be adjusted to an arbitrary value.

[0039] As described above, the lens grinding apparatus 1 of this embodiment is provided with the grinding water storage vessel (grinding water tank 3) for the storage of grinding water (discharged grinding water) after use in the glasses lens grinding work and the grinding water supply hose (grinding water discharge hose 19) for admitting grinding water into the grinding water storage vessel 3, further, the injection means (injection nozzle N) is attached to the tip 19a of the grinding water supply hose 19 to inject grinding water radially, thereby covering the surface of the grinding water already stored in the grinding water storage vessel 3 and extinguishing foams produced on the surface of the grinding water.

[0040] According to this construction, before grinding wastes contained in grinding water adhere fixedly to foams which are produced during inflow of grinding water into the grinding water storage vessel 3, grinding water

is injected radially so as to cover the grinding water already stored in the vessel 3, whereby the foams can be extinguished.

Claims

1. A lens grinding apparatus having a grinding water storage vessel (3) for the storage of grinding water including a grinding waste, which has been used in grinding a glasses lens, and a grinding water supply hose (19) which permits said grinding water to flow into said grinding water storage vessel (3), **characterized in that** an injection nozzle (N) is attached to a tip (19a) of said grinding water supply hose (19), and said grinding water is injected radially by said injection nozzle (N) to cover the surface of grinding water already stored in said grinding water storage vessel (3), thereby preventing foams from being produced on the surface of said grinding water in said grinding water storage vessel (3) when said grinding water flows into said grinding water storage vessel (3).

Patentansprüche

1. Linsenschleifvorrichtung mit einem Schleifwasser-Speichergefäß (3) für die Aufbewahrung von Schleifwasser enthaltend Schleifabfälle, das beim Schleifen einer Brillenlinse verwendet wurde, und einem Schleifwasser-Zuführungsschlauch (19), der das Fließen des Schleifwassers in das Schleifwasser-Speichergefäß (3) ermöglicht, **dadurch gekennzeichnet, dass** eine Injektionsdüse (N) an einer Spitze (19a) des Schleifwasser-Zuführungsschlauchs (19) angebracht ist und das Schleifwasser durch die Injektionsdüse (N) radial injiziert wird, um die Oberfläche des bereits im Schleifwasser-Speichergefäß (3) aufbewahrten Schleifwassers zu bedecken, wodurch die Bildung von Schaum auf der Oberfläche des Schleifwassers in dem Schleifwasser-Speichergefäß (3) verhindert wird, wenn das Schleifwasser in das Schleifwasser-Speichergefäß (3) fließt.

Revendications

1. Appareil de meulage de verres comprenant un récipient de stockage d'eau de meulage (3) destiné à stocker de l'eau de meulage comprenant des résidus de meulage, qui a été utilisée pour le meulage de verres de lunettes, et un tuyau flexible d'alimentation en eau de meulage (19) qui permet à ladite eau de meulage de s'écouler à l'intérieur dudit récipient de stockage d'eau de meulage (3), **caractérisé en ce qu'une** buse d'injection (N) est fixée sur une extré-

mité (19a) dudit tuyau flexible d'alimentation en eau de meulage (19), et **en ce que** ladite eau de meulage est injectée dans une direction radiale par ladite buse d'injection (N) afin de recouvrir la surface de l'eau de meulage déjà stockée dans ledit récipient de stockage d'eau de meulage (3), ce qui empêche la formation de mousses à la surface de ladite eau de meulage présente dans ledit récipient de stockage d'eau de meulage (3) lorsque ladite eau de meulage s'écoule à l'intérieur dudit récipient de stockage d'eau de meulage(3).

FIG. 1

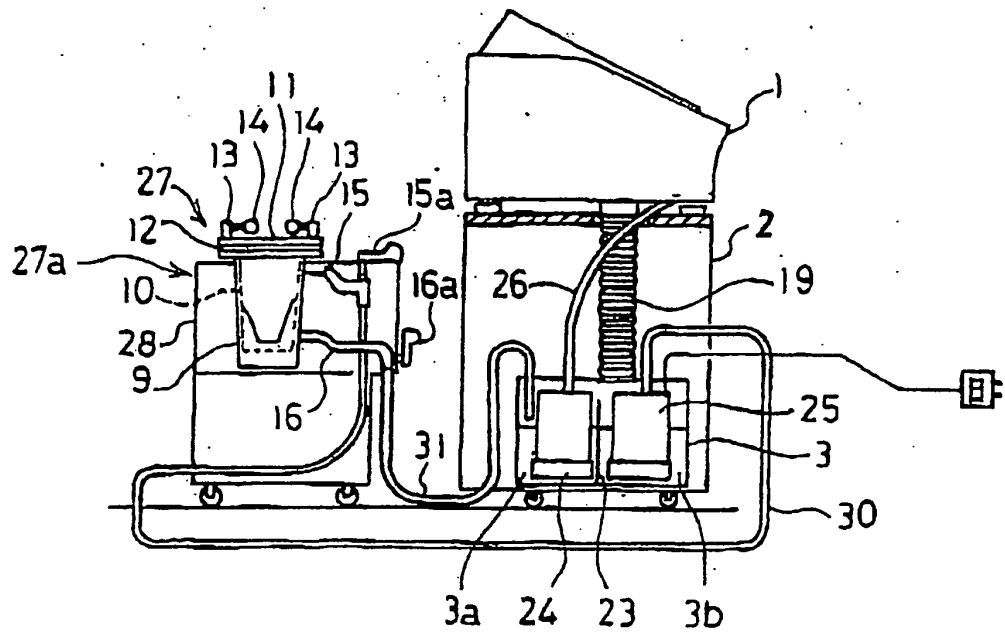


FIG. 2

