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- (71) Applicant : **ROEHLICH, Gerold** [DE/DE]; Argula-von Grumbach-Str. 15, 92345 Dietfurt (DE).
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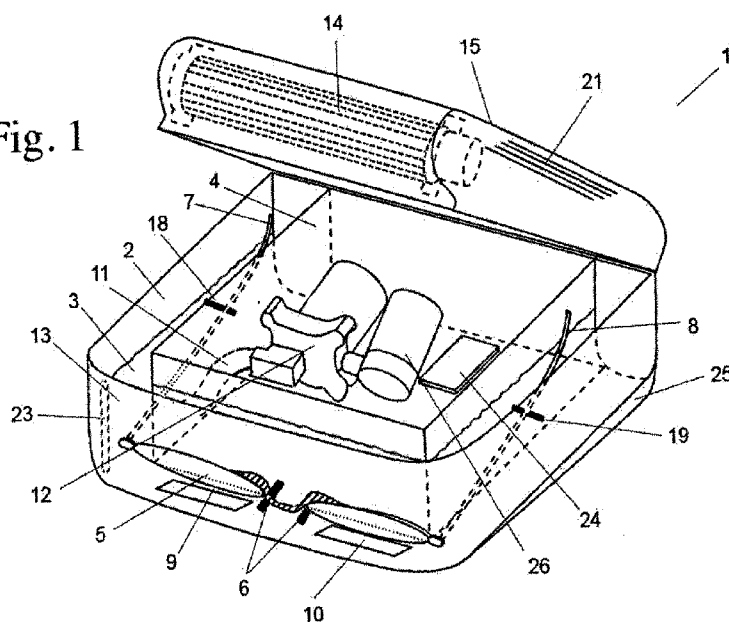
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(54) Title: ULTRASONIC CLEANING AND BLOW-DRYING DEVICE FOR SPECTACLES AND GOGGLES

(57) Abstract: Eyeglasses and goggles are perfectly cleaned in an U-formed trench with water and Ultrasonic vibration, followed by in situ forced air drying.

Fig. 1



Ultrasonic Cleaning and Blow-drying Device for Spectacles and Goggles

5 FIELD OF THE INVENTION

The invention relates to an apparatus for automatically cleaning glasses, in which spectacles first cleaned in an ultrasonic bath and then blown dry with air.

10

BACKGROUND OF THE INVENTION / PROBLEM TO BE SOLVED

Some wearers must constantly repeat cleaning their eyeglasses, which takes lengthy and careful handling to achieve perfect results.

15 Moreover, there are applications where e.g. goggles are used by different users, which should be cleaned before each transfer. However, this is rarely done by users, even if declared mandatory - or rarely carefully enough, since e.g. the plastic lenses of goggles can easily be ruined by scratches.

Manual cleaning hitherto is also indispensable, since normal drying in the air would
20 leave residues from dried-in droplets.

PRIOR ART

25 In the commercial sector, for example, at the optician's, the glasses are cleaned before handover in an ultrasonic cleaner and dried by hand. However, this takes some time and thus obstructs the finalizing of the sales transaction and possibly forces other customers to wait.

30 Although a variety of cleaning fluids and cleaning cloths for spectacles are known, there are also cleaning braces and spectacle cases, which carry out the cleaning with less manual effort.

DE 195 7070 U describes such a cleaning bracket with interchangeable pads,
35

DE 42 07 478 C2 and EP 02 25776 A2 have similar devices made with extendable cleaning strips, retractable from a protective sleeve, mutually moveable.

US 4,034,432 proposes a not further defined motor-operated and
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DE 298 10 702 U1 a battery powered device with mechanical lens cleaning device, whereas

US 6,772,766 even presents the idea of a lens cleaning wiper built into eyeglasses.
45

There are also numerous chemicals for cleaning glasses, as described in US 4,117,187, US 5,888,524, US 7,605,096, EP 0 233 943 and WO 89/05114.

Moreover, a variety of applicators and a variety of clear wiping aids are known.

- 5 However, with all these mechanical cleaning equipment and cleaners there is no result –especially at the edges and joints of the bracket– that could match ultrasonic cleaning.

10 OBJECT OF THE INVENTION

- Therefore it is the object of the present invention to provide an apparatus that would fulfil the cleaning task automatically and with high cleaning quality –even at the spectacle rims and hinges– without any further intervention by the operator (other than
15 loading the glasses into the device and to close the hood or push a start button).

SOLUTION

- 20 This is inventively achieved with a U-shaped trench, adjusted to the average size of eyeglasses or goggles, which is automatically filled with water (and possibly additives of cleaning fluid), wherein the glasses are treated with ultrasonic actuators which are arranged below or behind the lenses and provide ultrasonic vibrations. This cleans the glasses, which are immersed right up to the temple tips.

- 25 In a preferred embodiment, subsequently after cleaning, the trench is drained and the glasses will be dried by blowing them off with dry air. Therefore a fan is arranged in the hood of the set.

- 30 In one possible embodiment it will be a radial blower type that radiates from above through two open lids downstream upon the glasses and onto the front wall of the trench, so to also dry the back side of the glasses with resulting vortices.

- However, it is easier if the blower is a more silent tangential type that blows simply
35 downwards, but might take some more time to dry the glasses.

- Alternatively, in a second embodiment, instead of draining the trench, a lifting mechanism heaves the object out of it to the rear side of the opened hood, where it is dried by the airstream of a tangential blower mounted under the hood.

- 40 A timer or a moisture sensor ensures correct filling and draining of the trench, as well as automatic shutdown of the fan after drying.

CLOSER DESCRIPTION OF THE PREFERRED EMBODIMENT WITH REFERENCE TO THE DRAWING
FIG. 1:

The cleaning device (1) comprises an U-shaped trench (2), wherein water or cleaning
5 liquid (3) is pumped and discharged from a reservoir (4).

The glasses (5) can be inserted into it, supported with its bridge on brackets (6),
above the ultrasonic vibration transducers (9 and 10) and the temples (7, 8) posi-
tioned on support pins (18, 19).

10 After cleaning and pumping off the cleaning fluid through a hose (11), which serves
as inlet and drain to the (reversible-action) pump (12) through the filter (26) into the
reservoir (4), the air blower (14) in the hood (15) starts to operate.

The fan (14) being of the tangential type, blows just downwards into the trench (2) on
the glasses (5) and to the outer wall (13) of the trench, so to dry the rear side of the
15 glasses –which are supported by holding pins (19 and 20)– with appropriate turbu-
lence, whereas air pressure can evade through ventilation screens (21 and 22 –the
latter not visible here).

The humidity sensor (23) measures water level and the humidity. by which the elec-
tronics (24) in the base (25) governs the pump (12), and the fan (14).

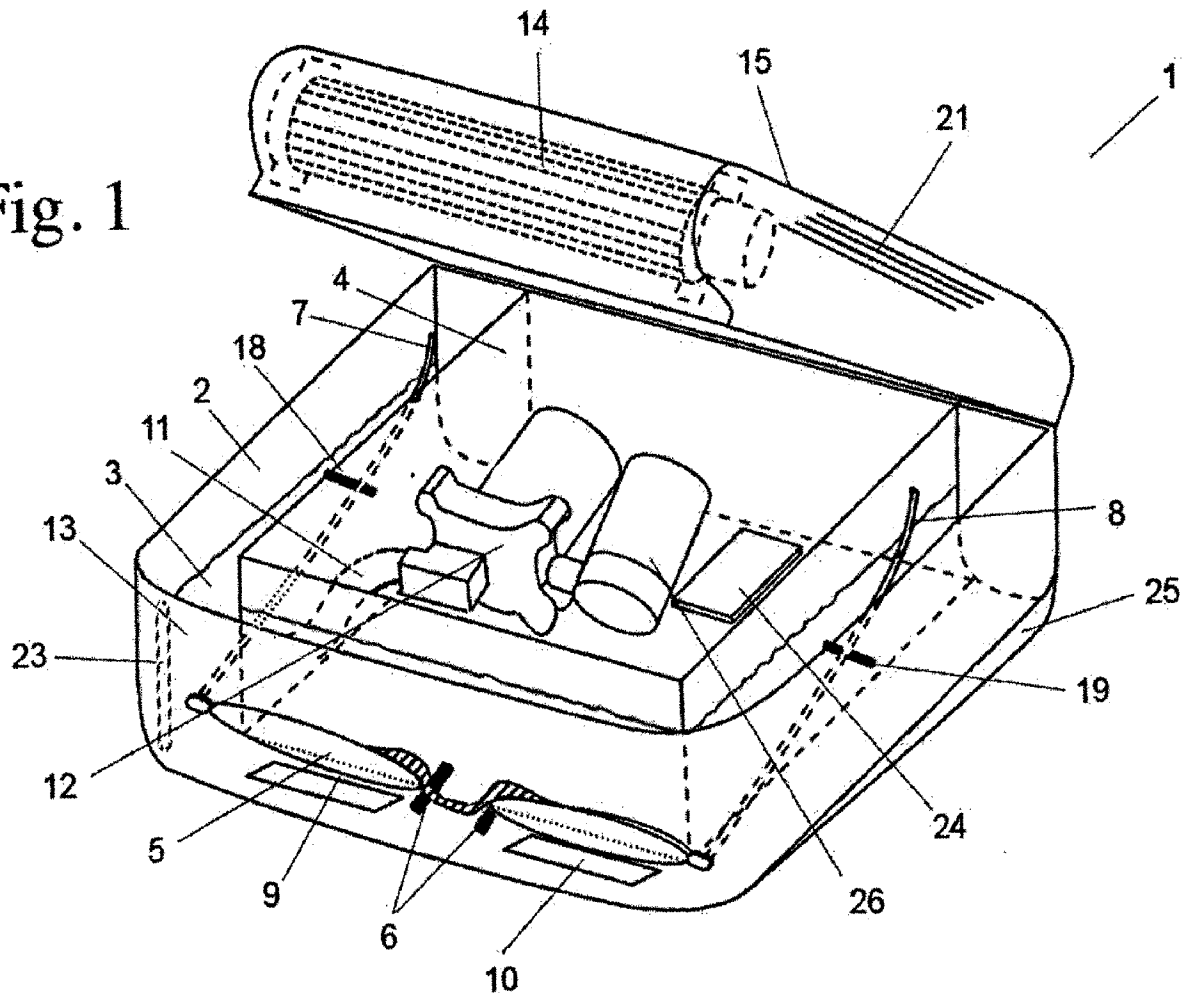
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CLAIMS

What is claimed is:

1. Ultrasonic cleaning and dry-blowing device for spectacles and goggles, comprising an U-shaped trench as water basin (2) and an air blower (14) for drying the glasses.
2. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 1, comprising a water reservoir (13) and a pumping and filtering system for filling and evacuating the water basin (2).
3. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 1, wherein the ultrasonic transducers (9 and 10) are fixed close to the middle of the trench, below or behind holding pins (6) for the bridge part of the glasses.
4. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 1, wherein an air blower system (14) is mounted into the hood of the device.
5. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 4, comprising an air blower (14) of the tangential type, the airstream of which is directed downwards into the trench on and by reflections and vortices behind the glasses.
6. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 4, comprising an air blower of the radial or axial type, which works through an intermediate volume on nozzles, directed downwards into the trench on and behind the glasses.
7. Ultrasonic cleaning and drying device for spectacles and goggles as to claim 5 and 6, wherein the hood (15) contains ventilation screens for exhaust of the air pressure from the blower on two sides of the trench, above the position of the temples.
8. Ultrasonic cleaning and dry-blowing device for spectacles and goggles as to claim 1, wherein a lift mechanism takes the spectacles or goggles out of the trench for blow-drying it.
9. Ultrasonic cleaning and drying device for spectacles and goggles as to claim 1, comprising one or more humidity sensors (23) for the electronics (24) to govern the drying system.

Fig. 1



INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G02C13/00 B08B3/12
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G02C B08B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.



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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Stadlmeyer, R

INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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International application No

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