RECEPTACLE FOR TREATING PHOTOGRAPHIC MATERIALS

Inventor: Helmut Berchtold, Gummersbach, Germany

Assignee: Firma Johannes Bockemuhl, Kupplungsstück, Germany

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Primary Examiner—Samuel S. Matthews
Assistant Examiner—Richard M. Sheer
Attorney—Michael S. Striker

ABSTRACT

A tank for processing photographic materials has an opening which is closed with a movable cover provided with an inlet and outlet for water. A hose is connectable with a source of water and a releasable connecting element connects the hose with the inlet in the cover. The connecting element has a flow passage for the water and is at least in part transparent so that the interior of the passage can be observed. Also, the connecting element has a port which communicates with the flow passage and which can be partly or completely closed at the will of the user.

14 Claims, 5 Drawing Figures
RECEPTACLE FOR TREATING PHOTOGRAPHIC MATERIALS

BACKGROUND OF THE INVENTION

The present invention relates generally to a receptacle, and in particular to a receptacle for treating photographic materials.

It is already known to provide receptacles or tanks for the treating of photographic materials, especially of film strips, which have an opening closed by a cover. The cover has two or more openings of which one is an inlet opening for water which is to be introduced into the tank, and the other is an outlet opening for excess water. The inlet opening is preferably but not necessarily located centrally in the cover and is connected with a hose or pipe which in turn communicates with a source of water.

One known construction of this type now utilizes a special connector by means of which one end of the hose is connected with a water faucet as the source of water, whereas the other end of the hose is provided with a connecting element of synthetic plastic material which is inserted into the inlet opening in the cover of the tank. In the region of this synthetic plastic connector a reduction in the diameter in the interior of the flow passage is provided in order to be able to obtain a high water pressure, because it is intended that the water should enter at high speed into the tank in order to obtain good agitation and watering of the photographic material therein.

This type of tank has a variety of possible applications, namely it can serve not only for watering of film or photographic materials but also for fixing and similar processing operations to be performed on photographic materials. This means that tanks of this general type eliminate the need for providing special tanks in which watering of photographic film strips would have to be carried out. However, and especially where the watering of film strips or other photographic strips is concerned, the known constructions have certain disadvantages. In particular it has been found that the watering times required for photographic strips are relatively long and are in excess of twenty minutes. Also, the formation of eddies by the water in the interior of the tank is still not as intense as desired, despite the reduction in the diameter of the inlet passage in the synthetic plastic connector which is intended to provide improved eddying. Other disadvantages of the prior art include the fact that it is impossible to inspect the interior of the tank and that the level of the water in the tank cannot be determined in the region of the inlet opening.

SUMMARY OF THE INVENTION:

It is thus a general object of the present invention to provide an improved construction which is not possessed of the disadvantages of the prior art.

More particularly, it is an object of the present invention to provide an improved receptacle or tank of the type hereunder discussed, in which the advantages of the prior art are retained but the disadvantages thereof are omitted.

An additional object of the invention is to provide such an improved construction in which the watering times required for the watering of photographic strip material are substantially reduced.

Still a further object of the invention is to provide such a construction in which the formation of eddies in the tank is promoted and increased.

A concomitant object of the invention is to provide such a construction in which the liquid or liquid level can be observed.

In pursuance of these and other objects which will become apparent hereafter, one feature of the invention resides in a receptacle, particularly a tank for processing of photographic materials, which comprises a vessel having an opening and a removable cover for this opening, which is provided with an inlet and an outlet aperture. A conduit is adapted to be connected with a source of liquid, and a connecting element is provided for connecting the conduit with the inlet aperture. The connecting element has a passage means communicating with the vessel and with the conduit and in accordance with the present invention it is provided with port means communicating with the passage means and being at least intermittently closable. Further, the connecting element is at least in part transparent for enabling viewing of the interior of the passage means.

A tank constructed in accordance with the present invention substantially reduces the required watering time, and tests which have been carried out have shown that watering times can be reduced to approximately 5 minutes as opposed to twenty minutes or more required in the prior art constructions. This assumes a water flow of approximately 4.5 liters per minute and a water temperature of approximately 15°C.

In particular it is an advantage of the construction according to the present invention that the water flow through the tank can be precisely adjusted, being capable of control in an exact manner due to the fact that it can be observed as a result of the at least partial transparency of the connecting element. The control itself is effected in very simple manner in that the port means is closed, for instance manually, so that the interior of the connecting element is no longer in communication with the ambient atmosphere. When the desired water level in the connecting element is reached, and thereby the desired quantity of flow obtained, then the port means is opened and ambient air is again aspirated by the flowing water, so that an increased eddy current formation in the interior of the tank and thus an improved watering effectiveness are obtained.

According to a currently preferred concept of the invention, the coupling or connecting element has a first or lower portion which is transparent and of tubular configuration, being dimensioned so that it can be inserted into the inlet opening of the cover. In addition, it has a second or upper portion which can be connected with the filling hose or conduit and which is provided with a reduced diameter section through which the passage for the water extends, and which section can be inserted into the interior of the first portion. This means that water does not enter directly and immediately into the interior of the tank or vessel, but instead first leaves the passage in the second portion to enter into the passage provided in the first portion of the connecting element, and only from there will enter into the interior of the tank. Because the first portion is preferably in its entirety of a transparent and clear material, for instance synthetic plastic or glass, the flow of water can be properly observed at all times and a precise control of the water level by intermittent closing of the port means can be effected.
It is advantageous if the second portion is provided with a shoulder with which it rests on a free end face of the first portion, so that the location of the reduced-diameter section of the second portion in the interior of the first portion is precisely determined and fixed. The two portions can be and remain discrete, but they can also be connected with one another after the second portion is in part inserted into the first portion, for instance by bonding them together along respective juxtaposed surface portions. The first portion of the connecting element is provided with at least one indicium or marking, and according to a currently preferred concept two such markings will be provided which are spaced from one another and configured by annular grooves provided on the outer circumferential surface of the first portion, although they could also be provided on the inner circumferential surface bounding the flow passage. When the port means is temporarily closed, water is allowed to rise in the first portion until the water level is between the two markings and when this position is reached, the port means is opened. This indicates that a precisely predetermined quantity of water flows through the passage. The markings can for instance be so located that a flow-through of approximately 4.5 liters of water per minute is obtained when the aforementioned water level is reached. The port means is advantageously located in the immediate vicinity of the free axial end face of the first portion so that it is as far as possible removed from the water level which is to be selected in the first portion intermediate the markings.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

**BRIEF DESCRIPTION OF THE DRAWING:**

FIG. 1 is a perspective view illustrating an arrangement of the present invention; and

FIG. 2 is an axial section through the connecting element in FIG. 1.

FIG. 3 is an axial section through a detail of a further embodiment;

FIG. 4 is a perspective view of a detail of still another embodiment; and

FIG. 5 is a cross-sectional view illustrating a detail of yet a further embodiment.

**DESCRIPTION OF THE PREFERRED EMBODIMENTS:**

Before entering into a detailed discussion of the drawing it should be pointed out that the receptacle or vessel itself is of known construction such as is utilized for watering tanks known from the art. It is made of a material, preferably synthetic plastic material, which is resistant to acids and the configuration of the tank itself can be selected in accordance with any of the known prior-art teachings as long as its removable cover is provided with two or more apertures.

In the illustrated embodiment of FIGS. 1 and 2, the vessel or tank is generally identified with reference numeral 3, being composed of the actual cylindrical vessel 4 and a removable cover 5 which closes an open side of the vessel 4. The cover 5 itself is provided with a centrally located inlet aperture 6 and laterally thereof with an outlet aperture 7 through which excess water is permitted to flow out.

A hose or conduit 9 is provided, one end of which is connected via a coupling 10 of known construction to a source of water, for instance the illustrated faucet or tap 11 which is mounted in the diagrammatically shown wall 12. This is of course known and need not be further described. The opposite end of the hose or conduit 9 is connected with the inlet opening 6 in the cover 5 by means of the connecting element which is generally identified with reference numeral 8.

The details of the connecting element 8 are shown in FIG. 2 where the connecting element is illustrated in an axial sectional view. FIG. 2 shows that the connecting element 8 has a first or lower portion 13 of which is of tubular configuration and which is in the illustrated embodiment made in its entirety of a transparent (preferably clear) material, such as glass or advantageously as synthetic plastic material. The end portion 14 of the first portion 13 is stepped for a decreased outer diameter, so that it can be readily inserted into the inlet opening 6 of the cover 5 until the shoulder 15 created by the stepped configuration abuts against the outer side of the cover 5. The flow passage in the interior of the portion 13 is, however, of constant cross section throughout its length. The outer circumferential surface of the portion 13 is provided with indicia here illustrated as two axially spaced annular grooves 16, and in the region of the upper or free end of the portion 13 there is provided a port 17 which communicates with the passage in the interior of the portion 13 and which can be intermittently closed, for instance by placing a finger of an operator over it.

The connecting element 8 further comprises a second or upper portion 18 which may be of a non-transparent or opaque material, for instance a synthetic plastic as illustrated, and which is so configured that a reduced-diameter section 19 and also a part of the larger diameter section can be inserted into the interior of the portion 13 as illustrated. A shoulder or flange 20 is provided which abuts against the free axial end face of the portion 13 to thereby limit the extent to which the portion 18 can be inserted into the portion 13 and provide for a precise positioning of the section 19 within the portion 13. The flange 20 is here configured as an annular flange but could of course have other configurations. The portion of the second portion 18 which extends outwardly of the portion 13, that is rearwardly of the flange 20, is connected with the hose or a conduit 9 as illustrated in FIG. 1. The portions 13 and 18 may be connected unitarily with one another as by a suitable adhesive or the like, to be applied for example to the axial end face of the portion 13 and the flange 20 of the portion 18.

It is clear from FIG. 2 that the portion 18 is provided with an axial flow passage 21 which constitutes a part of the overall flow passage composed of the passage 21 and the passage in the interior of the port 13. The passage 21 is also of constant cross-section throughout its entire length, as is the passage in the portion 13. The forward end of the section 19 extends somewhat beyond the mid-point of elongation of the portion 13, so that the water entering from the hose or conduit 9 via the passage 21 will not enter directly into the vessel 4 but will instead enter into the passage in the inte-
3,744,395

5

rior of the portion 13, and from there into the vessel 4. In operation, the flow of water can be precisely adjusted between the two grooves 16 by temporarily closing the port 17, for instance by placing a finger over it. The adjusted level of the water is identified at reference numeral 22 in FIG. 1 and is obtained by closing the port 17 until the water rises to the lever 22. When this level is reached the user knows that — depending upon the location chosen for the markings 16 — a quantity of for instance 4.5 liters of water per minute flows through the device, although this of course is only exemplary. Whereupon the port 17 is exposed again, the water aspirates air and carries it along, which results in the formation of increased eddies in the interior of the tank 3 and thus provides for substantially improved wa-
tering (and shorter watering time) of photographic ma-
terial in the tank 3.

It will be appreciated that modifications are possible in the embodiment illustrated without departing in any way from the scope or intent of the invention. For in-
stance, as shown in FIGS. 3 and 4, where like elements are identified with the same reference numeral but with an added prime, it is possible to make the portion 18' turnable within the portion 13 and to provide it with a part 23 which in a certain angular orientation of the portion 18 with reference to the portion 13 will close the port 17 to varying extents, that is partially or completely. In such a case the part would advantageously be of one piece with the remainder of the portion 18' and extend into the interior of the portion 13 to overlap the port 17 partly or completely, depending upon the relative angular position of the portions 13 and 18'. This eliminates the necessity for closing the port by hand.

The cross-sectional configuration of portion 13 is cir-
cular in the illustrated embodiment. However, it will be appreciated that it can also be other-than-circular, or polygonal if desired, as seen in FIG. 5. Furthermore, the section of the passage in the portion 13 may continu-
ously taper or converge in the direction towards tank 3 as shown in FIG. 3, and these measures may be real-
ized for accommodating the construction to circum-
stances prevailing in a given application. Also, the number of indicia and/or that of the ports, as well as the particular type and configuration thereof, can be differ-
ent from what has been illustrated.

It will be understood that each of the elements de-
scribed above, or two or more together, may also find a useful application in other types of constructions dif-
fering from the types described above.

While the invention has been illustrated and de-
scribed as embodied in a vessel for treating of photo-
graphic materials, it is not intended to be limited to the details shown, since various modifications and struc-
tural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for vari-
ous applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended:

1. A receptacle, particularly a tank for processing of photographic material, comprising a vessel having an opening;
a removable cover for said opening and provided with an inlet aperture and an outlet aperture;
a conduit adapted to be connected to a source of liq-
uid; and
a connecting element for connecting said conduit with said inlet aperture, said connecting element comprising an outer portion having a first passage therethrough and adapted to communicate with said inlet aperture, an inner tubular portion received in and defining with part of said first passage an annular clearance and having a second passage therethrough which communicates with said first passage upstream of said inlet aperture, one of said passages communicating with said conduit so as to receive liquid therefrom, said outer portion having at least one intermitently closeable part therein communicating with the other of said passages and with the ambient atmosphere for allowing air to be aspirated through said other passage and said port when flowing liquid fills at least part of said clearance and said first passage intermediate the inlet aperture and the clearance.

2. A receptacle as defined in claim 1, said connecting element being removably accommodated in said inlet aperture.

3. A receptacle as defined in claim 1, said outer por-
tion being transparent and removably accommodated in said inlet aperture, and wherein said tubular portion is connected with said conduit and has a section which extends coaxially into said outer portion.

4. A receptacle as defined in claim 3, wherein said portions are discrete components.

5. A receptacle as defined in claim 3, said outer por-
tion having a free end face located outwardly of said in-
let aperture, and said tubular portion having an addi-
tional section of one piece with the first mentioned sec-
section and connected with said conduit, and an outwardly extending shoulder at the junction of said sections in abutment with said free end face.

6. A receptacle as defined in claim 3, and further comprising at least one indicium provided on said outer portion.

7. A receptacle as defined in claim 3, and further comprising indicia provided on an outer circumferen-
tial surface of said outer portion in form of a pair of ax-
ially spaced annular grooves.

8. A receptacle as defined in claim 3, said port being provided proximal to an outer free end of said outer portion.

9. A receptacle as defined in claim 3, said tubular portion being turnable relative to said outer portion and including a part for closing said port to different extents in dependence upon the angular position of said tu-
bular portion with reference to said outer portion.

10. A receptacle as defined in claim 9, said part being an extension of said tubular portion, projecting into the interior of said outer portion.

11. A receptacle as defined in claim 9, wherein said outer portion is of polygonal cross-sectional configura-
tion.

12. A receptacle as defined in claim 3, wherein said outer portion is of other-than-round cross-sectional configura-
tion.

13. A receptacle as defined in claim 3, wherein the interior cross section of said outer portion tapers con-
tinuously in direction towards said inlet aperture.

14. A receptacle as defined in claim 1, wherein said connecting element is at least in part transparent.

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