March 9, 1971 J. G. BARBEN ET AL 3,568,281

PHOTOGRAPHIC FLASHBULB MANUFACTURING

Filed Jan. 23, 1969

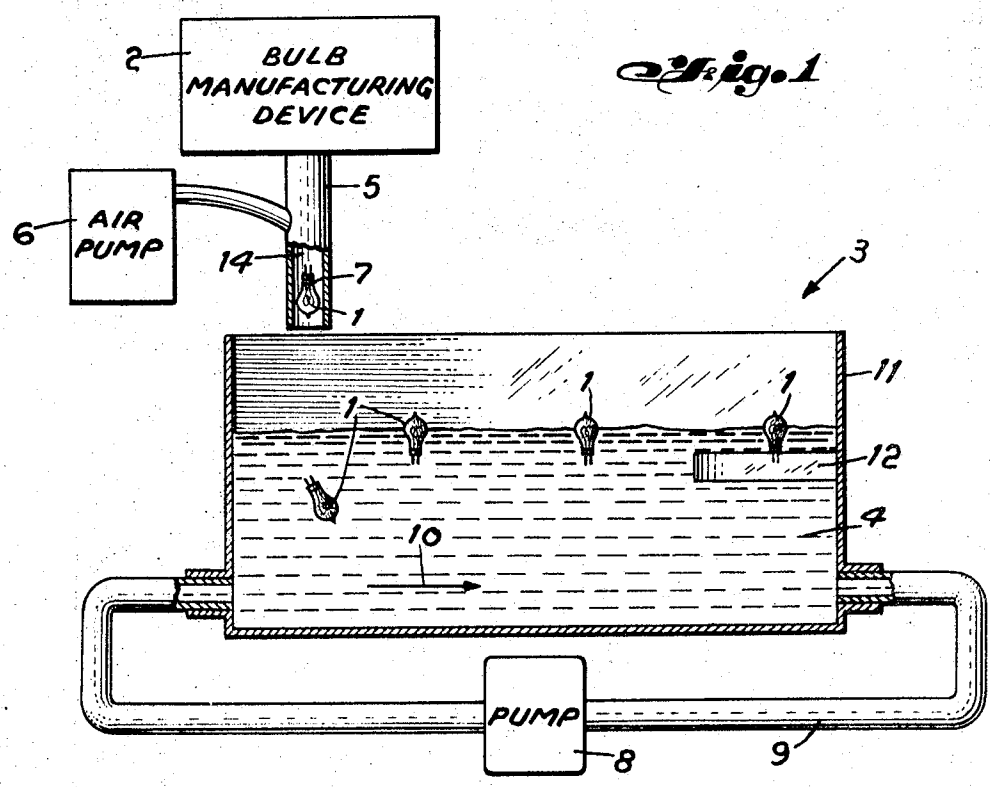
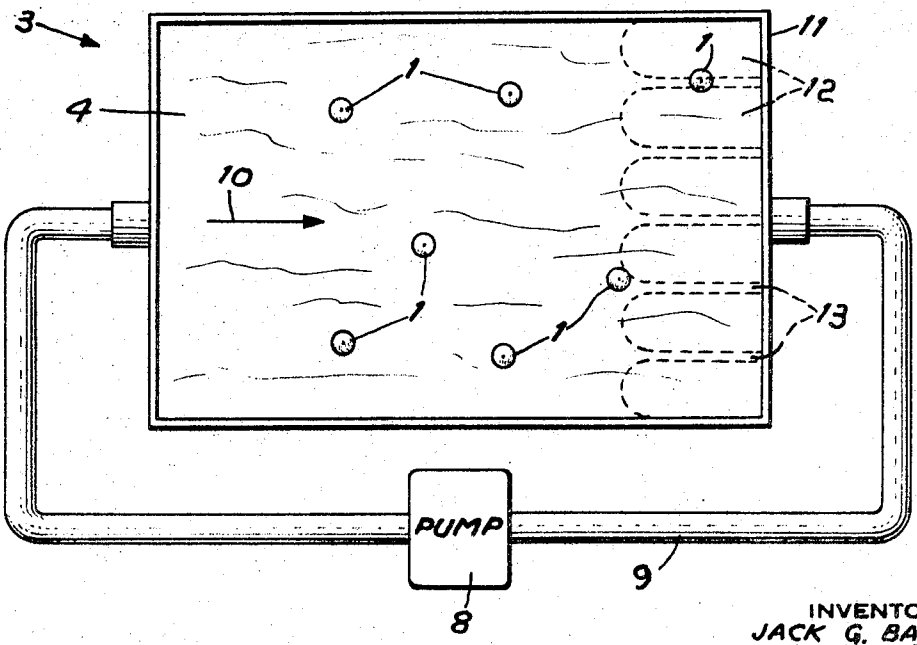


Fig. 1

Fig. 2



INVENTORS
JACK G. BARBEN
ERNEST J. GALLO
CHARLES W. JOHNSON
WILLIAM B. TYNDALE

ATTORNEY
Phillips, Moore, Weissenberger & Bolton

United States Patent Office 3,568,281 Patented Mar. 9, 1971

3,568,281

PHOTOGRAPHIC FLASHBULB MANUFACTURING

Jack G. Barben, Paramus, N.J., Ernest J. Gallo, Queens Village, and Charles W. Johnson, Huntington, N.Y., and William B. Tyndale, Waverly, Pa., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 23, 1969, Ser. No. 793,471
Int. Cl. H01j 9/16, 9/44
U.S. Cl. 29—25.18 13 Claims

ABSTRACT OF THE DISCLOSURE

A method and apparatus for processing flashbulbs including a pneumatic tube for injecting said bulbs, tip first, into a vat of trichloroethylene so as to distribute zirconium foil throughout the bulb and to clean said bulbs. A barrier is provided at one end of the vat remote from the impact area, said barrier having slots formed therein. A pump is provided to set up a current in the trichloroethylene for carrying the bulbs, which float downstream in the trichloroethylene, from the impact area to the barrier area of said vat. Each slot in said barrier is slightly wider than one wire of the two-wire contact leads of each bulb, and is located below the surface of the trichloroethylene, and below the glass portion of the bulbs, at the level of the wire contact leads, so that the wires can only fit into the slot in such a manner that they are rotationally oriented about their longitudinal axis.

BACKGROUND OF THE INVENTION

This invention relates to a method and apparatus for the processing of flashbulbs, and in particular to the distribution of foil within the bulbs, to the cleaning of said bulbs, and to the orientation of the bulbs so as to facilitate processing.

Prior art systems distributed the flashbulb foil by impacting the bulbs against rubber matting, but these systems are subject to the defect that the delicate wire contact leads are often bent after the bulbs rebound from the matting.

A further problem is that even if the wire leads are not bent after impact they are in a random configuration, and therefore expensive and time consuming methods of orienting the bulbs are required before further processing can take place.

SUMMARY OF THE INVENTION

An object of the present invention is therefore to provide a method and apparatus for the proper distribution of the foil within the bulb without damage to the wire contact leads of the bulb.

It is a further object of the present invention to provide apparatus for orienting bulbs having wire leads in a desired orientation so as to facilitate processing.

It is still another object of the present invention to provide for the cleaning of said bulbs while they are being oriented.

According to the present invention there is provided a method for distributing foil in a flashbulb by impacting the bulb into a liquid with sufficient force to distribute the flashbulb foil throughout the bulb.

According to another aspect of the invention there is provided apparatus for distributing foil in a flashbulb comprising a container for liquid, and means for forcibly injecting said flashbulb into said liquid.

According to the present invention there is further provided a method and apparatus for orienting flashbulbs in a desired manner so as to facilitate processing.

A feature of this invention is to provide a unidirectional current flow in said liquid and means for rotationally orienting said bulbs.

Further objects and features of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of apparatus embodying the invention; and

FIG. 2 is a top plan view of this embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, a flashbulb **1** received from a bulb manufacturing device **2**, is injected, tip down, into a vat **3** of liquid **4** via a pneumatic tube **5** driven by an air pump **6**. Shredded zirconium foil **7**, concentrated in the vicinity of the base of the bulb after it leaves said manufacturing device, is distributed throughout the bulb by being impacted into the liquid **4**. The liquid **4** should be chosen to be one having a sufficiently high specific gravity to float the bulbs, and preferably to float the bulbs at a predetermined level. It has been found that certain types of bulbs will float, crown up, in a liquid having a specific gravity greater than that of water and thereby be vertically oriented with respect to their longitudinal axes. The liquid may be, for example, trichloroethylene or perchloroethylene, which serves further to clean the bulbs.

A pump **8** and associated tubing **9** provide a current flow in said liquid in the direction shown by the arrow **10**. It is seen at this point that the flashbulb, vertically oriented with respect to the longitudinal axis of the bulb, as is desired, is now carried by the current toward the end **11** of vat **3**. At said end **11** of vat **3** there is provided a barrier consisting of blocks **12**, said barrier having formed therein slots **13**. Said slots are only slightly wider than the thickness of a single wire lead **14** of the two-wire leads of bulb **1**. The blocks **12** are located below the surface of the liquid, and below the level of the glass of the bulbs, at the level of said wire leads. It will therefore be seen that the two wires of each bulb can only fit into a slot in such a manner that the wires are aligned longitudinally in the slot, thereby rotationally orienting the flashbulb about its longitudinal axis in the desired manner. The bulbs are now in a suitable configuration for further processing and handling.

Referring to the top view of the invention shown in FIG. 2, where the pneumatic tube **5** is not shown, it is clearly seen how the floating bulbs are carried by the current into the slots **13** placing the bulbs in a predetermined orientation thereby facilitating subsequent processing.

We claim:

1. In the method of processing flushbulbs, the step comprising impacting a bulb into a liquid with sufficient force to distribute the flashbulb foil throughout the bulb.

2. The method of processing flashbulbs, according to claim **1**, including the step comprising orienting the bulb before impact so that the bulb is impacted tip first.

3. An apparatus for processing flashbulbs comprising:
a container for liquid; and
means for injecting a flushbulb into said liquid with sufficient force to distribute the flushbulb foil throughout the bulb.

4. An apparatus for processing flashbulbs, according to claim **3**, wherein said means for injecting said flashbulbs includes means for orienting the bulb prior to injection so that the bulb is injected tip first.

5. An apparatus for processing flushbulbs, according to claim **4**, wherein said means for injecting said flashbulbs

includes a pneumatic tube slightly greater in diameter than one of said bulbs.

6. In the method of processing flashbulbs the steps comprising:

floating the bulbs in a liquid so as to vertically orient each bulb with respect to its longitudinal axis;

providing a current flow in said liquid for transporting said bulbs from one part of the liquid to another part of the liquid; and

rotationally orienting each of said flush bulbs about its longitudinal axis.

7. An apparatus for processing flushbulbs comprising:

a container for liquid;

a liquid having a specific gravity sufficiently high to float said bulbs;

means for inserting said bulbs into said liquid, each of said bulbs being vertically oriented with respect to its longitudinal axis when floating in said liquid;

means for providing a unidirectional current in said liquid for transporting the bulbs from one area of said container to another area of said container; and

means for rotationally orienting each of said flashbulbs with respect to its longitudinal axis.

8. An apparatus for processing flashbulbs, according to claim 7,

wherein each of said flashbulbs has two wire contact leads; and

wherein said means for rotationally orienting said bulbs includes a barrier having at least one slot therein, said slot being located below the surface of said liquid and below the glass portion of said bulb at the level of the wires of said bulb, and only slightly wider than one wire of the two-wire contact leads of each bulb.

9. In the method of processing flashbulbs the steps comprising:

impacting the bulb into a flotation liquid with sufficient force to distribute the flash bulb foil throughout the bulb; and

vertically orienting each bulb with respect to its longitudinal axis by flotation of the bulb in said liquid.

10. The method of processing flashbulbs, according to claim 9, further including the step of rotationally orienting each bulb during flotation of the bulb in said liquid.

11. The method of processing flashbulbs, according to claim 9, further including the step of cleaning each bulb with said liquid.

12. An apparatus for processing flashbulbs comprising:

a flotation and cleaning liquid;

a container for said liquid; and

means for injecting a flashbulb into said liquid with sufficient force to distribute the flashbulb foil throughout the bulb and for vertically orienting each bulb with respect to its longitudinal axis by flotation of the bulb in said liquid.

13. An apparatus for processing flashbulbs, according to claim 12, comprising: means for rotationally orienting said bulb with respect to its longitudinal axis during flotation.

References Cited

UNITED STATES PATENTS

3,237,284 3/1966 Bird ---------- 29—25.18

JOHN F. CAMPBELL, Primary Examiner

R. B. LAZARUS, Assistant Examiner

U.S. Cl. X.R.

29—25.1, 25.11; 72—54; 269—20; 316—1, 17, 27