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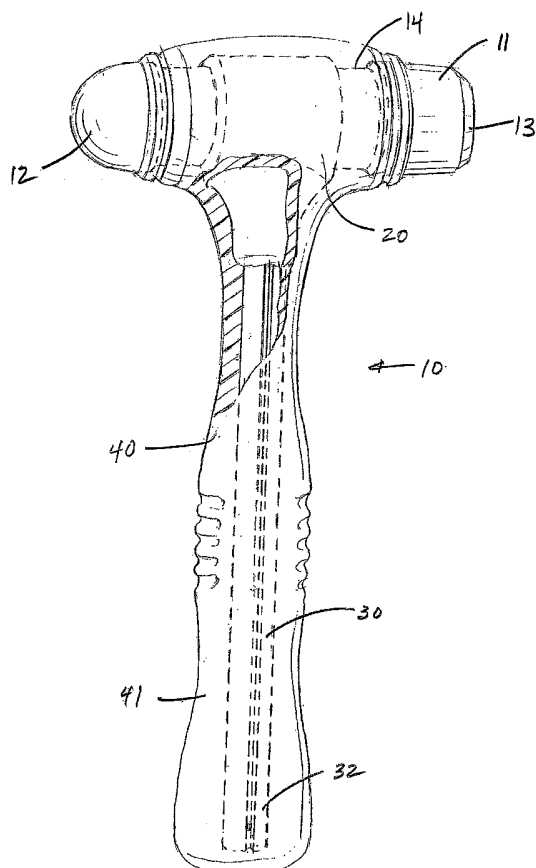
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[Continued on next page]

(54) Title: DEAD BLOW HAMMER WITH COMPOSITE HOLDER



(57) Abstract: A composite hammer (10) comprising a head (11) having a periphery (14) and a longitudinal axis, a collar (20) disposed substantially about the periphery (14) and having an inner surface (21) and a neck tube (22) projecting radially outwardly therefrom, the neck tube (22) being inclined relative to the longitudinal axis, and a handle (30) having a proximal working end (31) received in the neck tube (22) and a distal end (32).



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DEAD BLOW HAMMER WITH COMPOSITE HOLDER

Background of the Invention

5 This application relates generally to impact tools, such as hammers, and, more particularly, relates to hammers of the type designed to minimize rebound, commonly referred to as "dead blow hammers."

Dead blow hammers are typically provided with a head which is, at least, partially filled with a flowable, rebound-inhibiting material, such as steel pellets or shot. As such, the rebound-inhibiting material absorbs a majority of the impact force
10 when the hammer impacts a work surface and prevents a rebound effect. However, many such hammers have handles which extend into the tubular hammer head, thus impeding the free-flowability of the rebound-inhibiting material.

It is known to provide dead blow hammers formed from a skeleton consisting of a hammer head and handle framework, partially or fully encapsulated or encased within
15 an outer casing or covering which may be overmolded onto the skeleton. However, such prior encapsulated hammers have had complicated or require expensive skeletal structures and/or have been characterized by less than optimal weight distribution between the hammer head and the handle. Further, the hammer head and the handle are typically formed of the same material, thus providing a conduit for the transmission
20 of vibrational forces during use.

U.S. Patent no. 6,595,087, which is commonly assigned with the present application, optimizes the weight distribution between the hammer head and the handle and avoids penetration of the head with the handle by providing a radially, outwardly projecting neck tube integrally coupled to the hammer head, such as with a weldment,
25 and adapted to receive a working end of the handle, which may be formed of any material. The hammer head and handle are then overmolded with a plastic material.

Summary of the Invention

The present application discloses an improved dead blow hammer, and a
30 method for making the same, having a skeleton consisting of a hammer head, a collar adapted to be disposed substantially about the hammer head, and a handle. The collar includes a neck tube outwardly radially extending therefrom which is adapted to receive a working end of the handle. In an embodiment, the assembled hammer,

including the hammer head, the collar and the handle, is substantially encapsulated with a casing.

Brief Description of the Drawings

5 For the purpose of facilitating an understanding of the subject matter sought to be protected, there is illustrated in the accompanying drawing embodiments thereof, from an inspection of which, when considered in connection with the following description, the subject matter sought to be protected, its construction and operation, and many of its advantages, should be readily understood and appreciated.

10 FIG. 1 is a perspective view of a hammer encapsulated within a casing, with a portion broken away.

FIG. 2 is a reduced, side elevational view of the hammer of FIG. 1 shown removed from the casing, with a portion broken away.

15 FIG. 3 is a front elevational view of the hammer of FIG. 2, shown with the hammer head removed.

FIG. 4 is a perspective view of the collar of FIG. 3.

FIG. 5 is a front view of the collar of FIG. 4.

FIG. 6 is an enlarged, fragmentary view of the encircled portion of the collar of FIG. 5.

20 FIG. 7 is a side cross-sectional view taken generally along the line 7-7 of FIG. 5.

FIG. 8 is a bottom view of the collar of FIG. 5.

Detailed Description

25 Referring to Figs. 1-3, the present application discloses a composite hammer 10. In an embodiment, the hammer 10 is a dead blow hammer having a skeleton including a substantially tubular hammer head 11 having first and second ends 12, 13, that are adapted to be impacted against a work surface, and a periphery 14. In an embodiment, first and second ends 12, 13 are caps integrally coupled, such as, for
30 example, with a friction fit, weldment or adhesion, to the periphery 14 respectively adjacent to the opposing ends of the tubular hammer head 11. The hammer head 11

may be filled with a substantially flowable, rebound-inhibiting material 14. In an embodiment, the hammer head 11 is substantially cylindrical. The substantially cylindrical shape of the hammer head defines a longitudinal axis. In an embodiment, first end 12 is substantially rounded or conical and second end 13 is substantially flat.

- 5 In an embodiment, the rebound-inhibiting material includes a plurality of rigid pellets. In an embodiment, the pellets are steel shot.

In an embodiment, the hammer includes a collar 20 disposed substantially about the periphery 14 and intermediately on the hammer head 11, and a handle 30 having a working end 31 and a distal end 32. The hammer head 11, the collar 20 and
10 the handle 30, when in an assembled condition, may be substantially overmolded or encapsulated with a casing 40. The casing 40 may be formed of an elastomeric material. Casing 40 may include an overmolded or formed resilient grip 41 disposed adjacently to the distal end 32.

- In an embodiment, the handle 30 is formed of a fibrous material, such as, for
15 example, fiberglass or carbon fiber.

Referring also to Figs. 4-8, in an embodiment, the collar 20 may be substantially cylindrical and includes an inner surface 21. In an embodiment, the collar 20 includes a radially outwardly extending, substantially tubular neck tube 22 that is adapted to receive the working end 31 of the handle 30. In an embodiment, the
20 inner diameter of the neck tube 22 is substantially the same as the outer diameter of the working end 31 of the handle 30. In an another embodiment, the inner diameter of the neck tube 22 is slightly less than the outer diameter of the working end 31 of the handle 30, so that when in an assembled condition, the neck tube 22 and the working end 31 of the handle 30 form a press-fit connection. In yet another embodiment, the
25 working end 31 of the handle 30 may be adhesively secured within the neck tube 22.

When the hammer 10 is in an assembled condition, the neck tube 22 is inclined relative to the longitudinal axis. In an embodiment, the neck tube 22 is substantially perpendicular to the longitudinal axis.

- In an embodiment, the inner surface 21 of the collar 20 is adapted to form a
30 friction-fit with the periphery 14 of the hammer head 11 when the collar 20 is disposed substantially about the periphery 14 and intermediately on the hammer head 11. The

inner surface 21 may include a plurality of inwardly extending ribs 23 that are substantially parallel to the longitudinal axis and are adapted to frictionally engage the periphery 14 when the hammer 10 is in an assembled condition. The ribs 23 may be circumferentially disposed about the inner surface 21 and be substantially
5 equiangularly spaced relative to each other.

Also disclosed herein is a method of making a hammer. The method comprises providing a substantially tubular head having a periphery and a longitudinal axis, frictionally fitting a collar having an inner surface and a neck tube radially outwardly projecting therefrom with the head so that the collar is substantially intermediately
10 disposed on the head and the neck tube is inclined relative to the longitudinal axis, inserting a proximal, working end of a handle in the neck tube, and substantially encapsulating the head, the collar and the handle with an elastomeric casing. The method may further comprise adhesively securing the handle to the neck tube. The method may also comprise overmolding a grip on the casing adjacent to a distal end of
15 the handle or filling the head with a substantially flowable, rebound-inhibiting material.

From the foregoing, it can be seen that there has been described an improved dead blow hammer which is of simple and economical construction, improved weight distribution and force-delivering capacity, and improved vibration resistance and
20 ergonomic design.

The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only and not as a limitation. While particular embodiments have been shown and described, it will be apparent to those skilled in the art that changes and modifications may be made without departing from the broader
25 aspects of applicants' contribution. The actual scope of the protection sought is intended to be defined in the following claims when viewed in their proper perspective based on the prior art.

CLAIMS

1. A composite hammer comprising:
a head having a periphery and a longitudinal axis;
5 a collar disposed substantially about the periphery and having an inner surface
and a neck tube projecting radially outwardly therefrom, the neck tube being inclined
relative to the longitudinal axis; and
a handle having a working end received in the neck tube and a distal end.
2. The hammer as claimed in claim 1 wherein the collar is substantially
10 cylindrical.
3. The hammer as claimed in claim 1 wherein the head is tubular.
4. The hammer as claimed in claim 3 wherein the head contains a
substantially flowable, rebound-inhibiting material.
5. The hammer as claimed in claim 4 wherein the material includes a
15 plurality of rigid pellets.
6. The hammer as claimed in claim 1 wherein the handle is formed of a
fibrous material.
7. The hammer as claimed in claim 6 wherein the fibrous material is
fiberglass.
- 20 8. The hammer as claimed in claim 1 further comprising a casing
substantially encapsulating the head, the collar and the handle.
9. The hammer as claimed in claim 8 wherein the casing is formed of an
elastomeric material.
10. The hammer as claimed in claim 9 wherein the casing includes a
25 resilient grip disposed adjacent to the distal end of the handle.
11. The hammer as claimed in claim 1 wherein the inner surface includes a
plurality of radially inwardly projecting ribs.
12. The hammer as claimed in claim 11 wherein the ribs are substantially
equiangularly spaced relative to each other.
- 30 13. The hammer as claimed in claim 1 wherein the inner surface and the
periphery form a friction fit therebetween.

14. The hammer as claimed in claim 1 wherein the working end of the handle is adhesively secured to the neck tube.

15. An apparatus for coupling a handle to a substantially cylindrical hammer head, comprising a collar for disposition substantially about the hammer head and having an inner surface and a neck tube projecting radially outwardly therefrom for receiving an end of the handle.

16. The apparatus as claimed in claim 15 wherein the collar is substantially cylindrical.

17. The apparatus as claimed in claim 15 wherein the inner surface includes a plurality of radially inwardly projecting ribs.

18. The apparatus as claimed in claim 17 wherein the ribs are substantially equiangularly spaced relative to each other.

19. A hammer comprising:
a tubular head having a periphery and a longitudinal axis;
a collar disposed substantially about the periphery and having an inner surface with a plurality of substantially equiangularly spaced, radially inwardly projecting ribs and a neck tube radially outwardly projecting therefrom, the neck tube being inclined relative to the longitudinal axis;

a handle having a working end received in the neck tube and a distal end; and
an elastomeric casing substantially encapsulating the head, the collar and the handle, the casing including a resilient grip disposed adjacent to the distal end of the handle.

20. The hammer as claimed in claim 19 wherein the collar is substantially cylindrical.

21. The hammer as claimed in claim 19 wherein the head is substantially tubular.

22. The hammer as claimed in claim 21 wherein the head contains a substantially flowable, rebound-inhibiting material.

23. The hammer as claimed in claim 22 wherein the material includes a plurality of rigid pellets.

24. The hammer as claimed in claim 18 wherein the handle is formed of a fibrous material.

25. A method of making a hammer, comprising:

providing a tubular head having a periphery and a longitudinal axis;

5 frictionally fitting a collar having an inner surface and a neck tube radially outwardly projecting therefrom with the head so that the collar is substantially intermediately disposed on the head and the neck tube is inclined relative to the longitudinal axis;

inserting a proximal end of a handle in the neck tube; and

10 substantially encapsulating the head, the collar and the handle with an elastomeric casing.

26. The method as claimed in claim 25 further comprising adhesively securing the handle to the neck tube.

27. The method as claimed in claim 25 further comprising overmolding a
15 grip on the casing adjacent to a distal end of the handle.

28. The method as claimed in claim 25 further comprising filling the head with a substantially flowable, rebound-inhibiting material.

29. A hammer comprising:

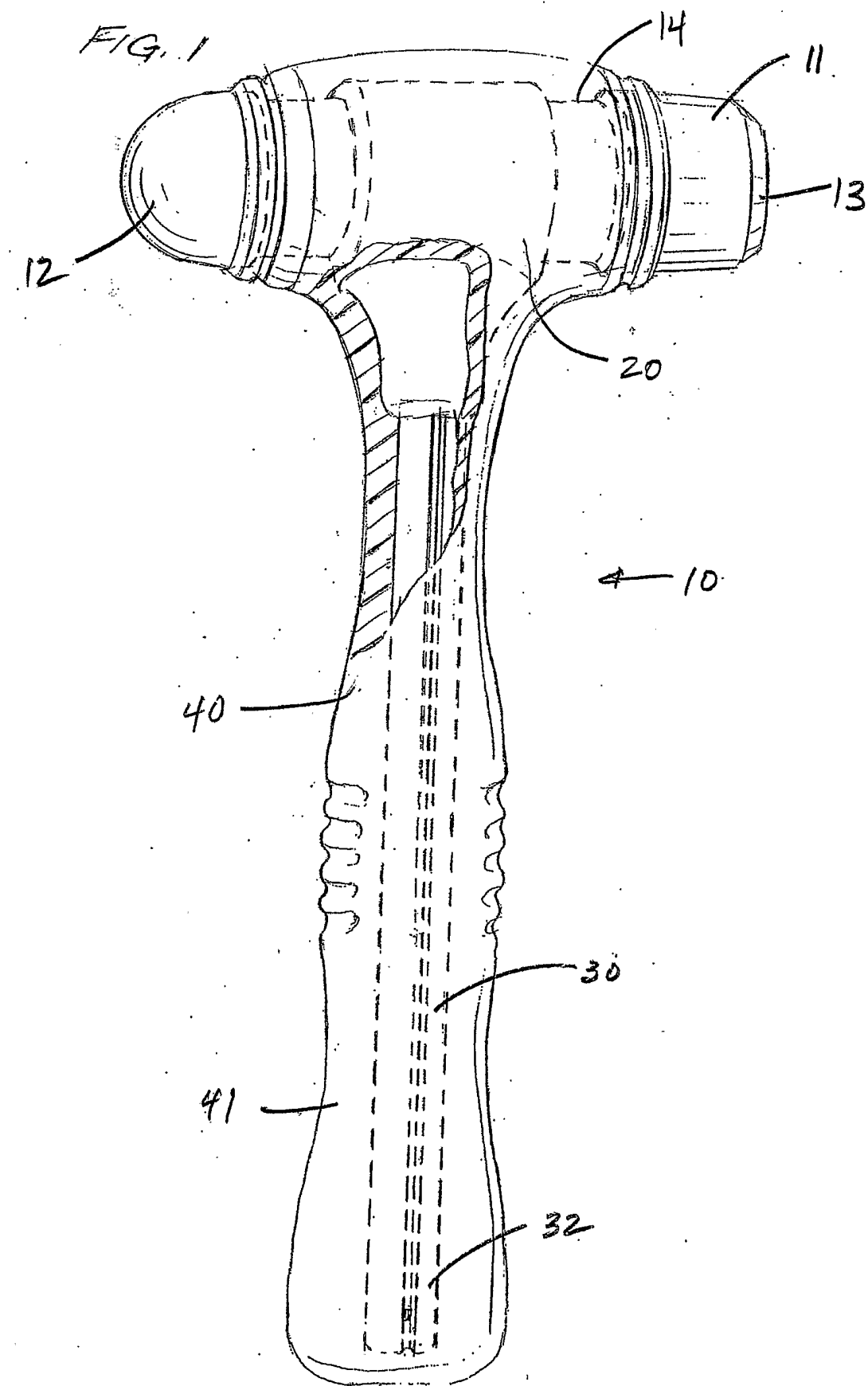
a hammer head having a periphery and a longitudinal axis; and

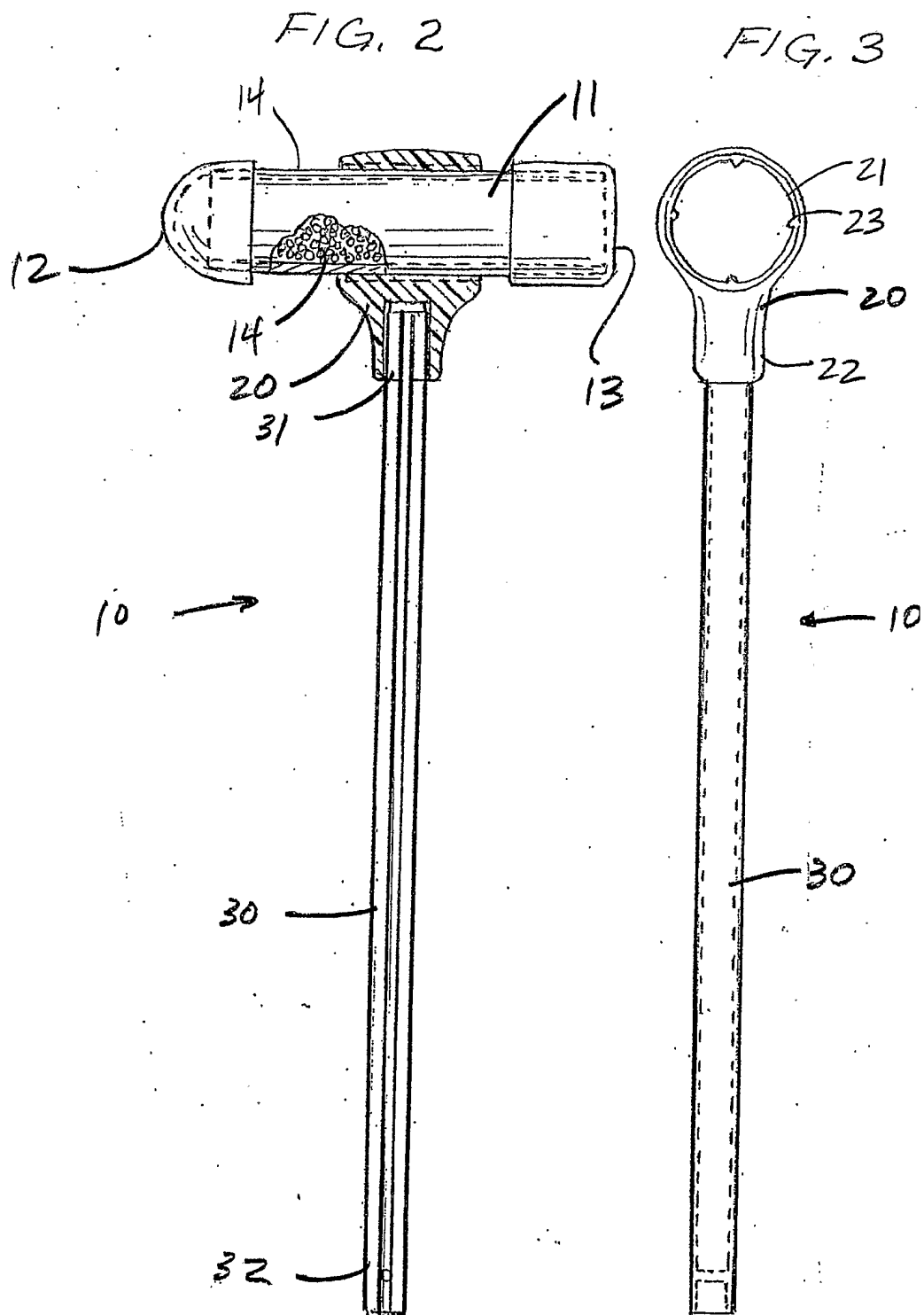
20 a means for coupling a handle to the hammer head.

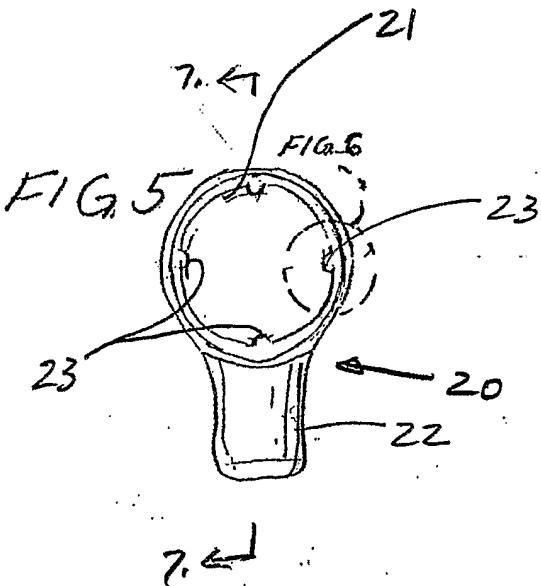
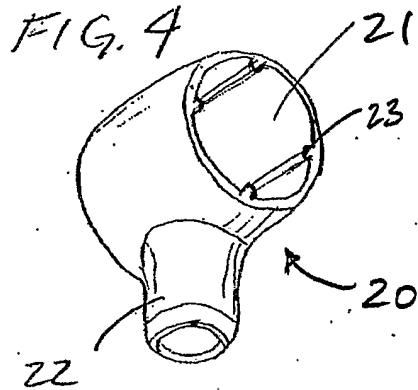
30. The hammer as claimed in claim 29 wherein the means for coupling a handle to the hammer head includes a collar disposed substantially about the periphery having a neck tube radially outwardly projecting therefrom for receiving a working end of the handle, the neck tube being inclined relative to the longitudinal axis.

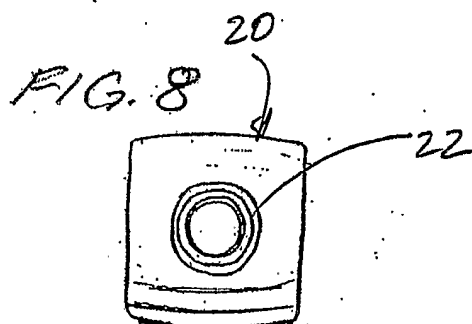
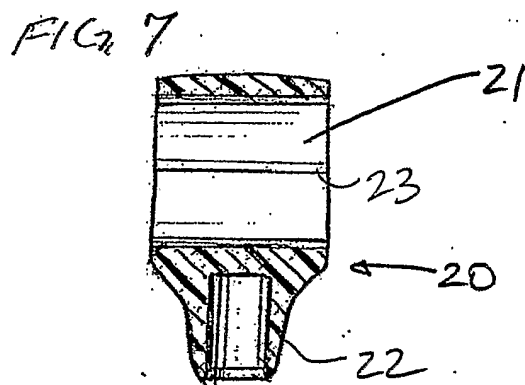
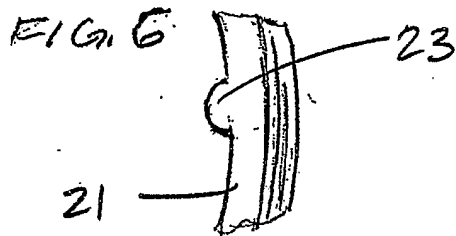
25 31. The hammer as claimed in claim 30 wherein the neck tube includes an inner surface having a plurality of substantially equiangularly spaced, radially inwardly projecting ribs.

32. The hammer as claimed in claim 29 further comprising an elastomeric casing substantially encapsulating the hammer head, the means for coupling and the
30 handle, the casing including a resilient grip disposed adjacent to the distal end of the handle.









INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/038501

A. CLASSIFICATION OF SUBJECT MATTER
B25D1/12

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)
B25D

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 6 052 885 A (CARMEN ET AL) 25 April 2000 (2000-04-25) column 3, lines 25-30, paragraph 19-24 - lines 50-65; figure 3	1-18, 29-32 19-24
A	US 5 031 272 A (CARMEN ET AL) 16 July 1991 (1991-07-16) column 6, line 61 - column 7, line 22	1-32
A	US 3 844 321 A (COOK W,US) 29 October 1974 (1974-10-29) column 3, line 9 - line 10; figures	25-28
A	US 6 595 087 B2 (WAHLEN) 22 July 2003 (2003-07-22) cited in the application column 2, line 40 - line 55 column 3, line 30 - line 35	1-32
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

17 March 2006

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/038501

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 SEARCH REPORT

Information on patent family members

International application No

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