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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 :		(11) International Publication Number:
H04M 1/03	A1	WO 89/ 09524
		(43) International Publication Date: 5 October 1989 (05.10.89)

(21) International Application Number: PCT/AU89/00129

(22) International Filing Date: 29 March 1989 (29.03.89)

(31) Priority Application Number: PI 7543

(32) Priority Date: 31 March 1988 (31.03.88)

(33) Priority Country: AU

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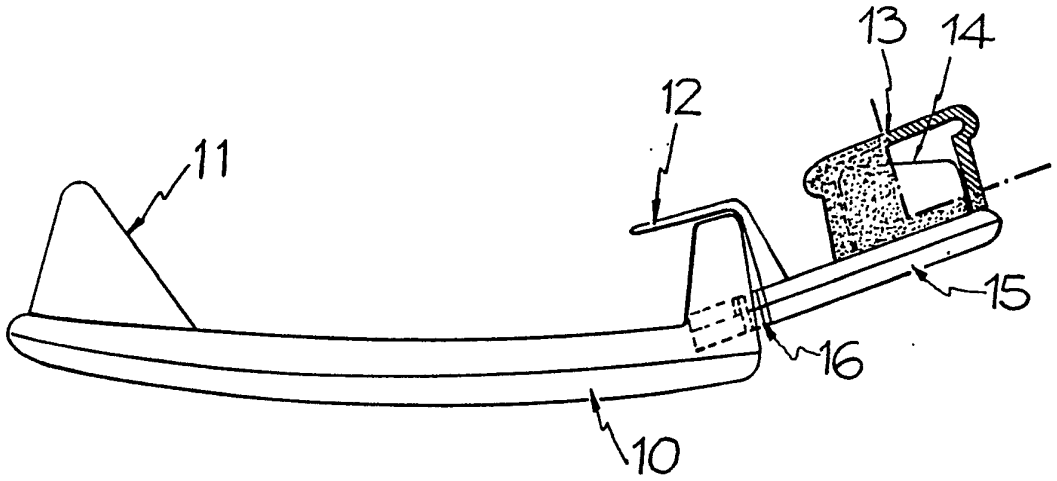
(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE, DE (European patent), DK, FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.

Published
With international search report.

(54) Title: IMPROVEMENTS RELATING TO TELEPHONE HANDSETS



(57) Abstract

An ergonomic telephone handset (10, 30, 40, 50, 62, 70) having a body comprising a speaker portion (13, 14, 23, 24, 33, 42, 51, 61, 72, 76), a microphone portion (11, 31, 41, 52, 63, 71) and handle portion joining said speaker and microphone portions wherein the speaker portion includes an ear engaging portion which is pivotably (16, 26, 32, 34, 37, 44, 54, 73) or flexibly supported (13, 17, 22, 38, 43, 53, 60, 76) relative to said handle portion such that in use, the speaker portion is maintained substantially aligned with a user's ear irrespective of the location of the hand piece. The speaker portion may be mounted upon a pivotal joint (26, 36, 37, 32, 73) or universal joint (54). The ear piece may be made of flexible foam like material (13, 19, 22, 43, 53, 60, 76) to provide said flexing support to comfortably contact the ear of a user so that the ear piece remains aligned with the ear independent of any movement of the handle portion. The body portion may be encased with a tough plastic mesh material (74) which in turn is coated with soft plastic material forming a totally enclosing outer shell (75) over the body portion of the handset. The ear piece (15) may incorporate a cheek bone rest portion (12).

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IMPROVEMENTS RELATING TO TELEPHONE HANDSETS

BACKGROUND OF THE INVENTION

The present invention relates to the provision of a telephone handset of ergonomic design.

The functionality of the modern telephone is far greater than the original devices and the telephone of today is even more refined than those of a just a few years ago.

The past decade has seen a major advance in design technology, creating telephones which are easier to use and capable of a multiplicity of functions. Included among these innovations are: a hand free function which allows conversations through the use of an internal loudpeaker, on-hook dialing, abbreviated dialing, memory functions, minor calculating/computing functions, automatic transfer of calls, LED readouts. All these are embodiments which rely in part on the inbuilt mechanics of the telephone unit itself, a modern internal technology which is also augmented by the capabilities of the PABX - the Private Automatic Branch Exchange.

In stark contrast to functionality, and considering that the design of the telephone has undergone dramatic cosmetic modifications, the visual and ergonomic theory of the handset has remained basically static and its inherent theoretical approach unaltered since circa 1893 when the ear and mouth pieces were first joined into one unit.

Although the telephone, given that it normally consists of a base control unit and accompanying handset, has been modernised in form, it remains basically identical in intent as when originally conceived. Apart from more modern designs the only palpable advance in exterior appearance has been the introduction of a push button keypad. This has now replaced the rotary dialler, though even this embodiment is a relatively recent innovation considering the long history of the telephone. Until recently, the design of the telephone handset has followed the constraints which were originally placed upon its form, by the technology which existed at the time it was first manufactured.

Decades ago the microphone and speaker units were bulky and thus the handset containing both was equally cumbersome. Today, both microphone and speaker technologies have drastically improved and each device is now minute in comparison to its predecessor which has led to smaller, more compact handsets in flagrant disregard for the ergonomic function of the unit. Emphasis has been placed on miniaturising the handset, of forming it about the face of a user or moulding a more comfortable grip instead of addressing the ergonomic deficiencies inherent from the earliest manifestation of the handpiece. There is a basic, hitherto unseen, theoretical flaw in all known embodiments of the telephone handset. There is little or no evidence that telephone designers have considered the overall ergonomics of the product and appear to have made the mistake of concentrating on the hand and face whilst ignoring the total interaction of head, hand, wrist, arm and shoulder.

Therefore any claimed ergonimic capability has been partial at best. Such ergonomic oversights have resulted in the continued production of telephone handsets whose basic design tenet remains theoretically flawed.

Unfortunately, such technical progress has created handset/base products which are conceived by those of a technical or engineering background - scientific expertise which is then transformed into products which seemingly ignore the "human factor ergonomics" intrinsic in this field of communication, or by designers with no "long term" knowledge of how the product is actually used.

With regard to the human interaction factor, many obvious examples exist regarding the lack of environmental consideration; thorough examination of design philosophy or ergonomic practicality: dialling mechanisms which are far too small for ease of use, handsets which are so compact as to be uncomfortable, facilities too varied and too complicated for most to bother with, limited choice of colour and no supplied alternatives to personalise product, use by the handicapped mostly ignored, phone boxes which are noisy.

The major function of the telephone is to perform a clear means of communication, however the substandard performance of the product in noisy environments as now exists, is patently inadequate. It is also a major objective that the telephone is comfortable to use even in long telephone conversations.

In my earlier international patent application No. W087/07798 I had disclosed an ergonomic telephone having a handset inter alia, having a speaker portion shaped or constructed to rest against the cheek bone or skull of the user and having a handle portion located to minimise muscular stress in the body of the handset user.

SUMMARY OF THE INVENTION

It is a principle objective to provide a telephone handset designed for use in a variety of positions allowing natural positioning of the hand, wrist, upper arm and shoulder in comfort yet maximising the performance of the handset.

In use, as specifically designed, the conventional handset requires the user to position the grip portion, and thus the hand, between his/her ear and mouth which raises the arm up and away from the body whilst also creating a lateral twisting motion of the wrist. Complex anatomical interactions are involved in performing the seemingly simple task of holding a telephone handset. The shoulder, upper and lower arm, the wrist and the hand must all be engaged then remain stressed to hold the conventional telephone in the position the handset was designed to retain to maintain and maximise efficiency of useage of the handset.

Thus the present invention sets out to provide a design which minimises the energy required in lifting, holding and replacing the handset, while reducing the anatomical stress needed to retain the optimum technical position. Obvious advantages stem from improved design particularly in long conversations.

There is provided according to the present invention a telephone handset having a body comprising a speaker portion, microphone portion and a handle portion, joining said speaker and microphone portions, wherein said speaker portion includes an ear engaging portion which is pivotally or flexibly supported relative to said handle portion such that in use the speaker portion is maintained substantially aligned with a users ear irrespective of the location of the hand piece.

There is also provided a telephone handset having a body comprising a speaker portion, microphone portion, and a handle portion, wherein said speaker portion is flexed, or hinged, or universally movable relative to the users ear in use.

Conveniently, the handset includes a resilient material to provide a flexible soft pad which upon contact with the ear is adapted to re-position and conform to an angle relative to the head of the user to follow the natural line of the ear.

Conveniently, the speaker portion is attached to the body portion of the handset by a universal pivotal connection to allow at least partial rotatable movement relative to said handset in an axis generally along and laterally of the handset to ensure substantial alignment of the speaker portion with the ear of a user when in use.

In a further form of the invention, at least the speaker portion is provided with a cap member, preferably of soft foam like material, said cap member being slidably mounted relative to said speaker portion so as to align itself in use with the ear of a user.

Conveniently, the cap member may be of hard material mounted on a universally pivotal speaker portion.

Conveniently, the speaker portion of the handset includes an ear piece, a cap member mounted on said ear piece, said cap member being slidable relative to said ear piece to allow relative movement such that when engaged with a user's ear in use, it will align with the ear. The cap

member may be positioned on the ear piece and be under the influence of a biasing spring or like member allowing movement of the cap member to substantially align itself with a user's ear in use but returning the cap member to a stable "at rest" position when not in use.

In a further form of the invention, there is provided a telephone handset including a speaker portion, handle portion and mouthpiece portion in which the speaker portion is moveable relative to said handle portion to substantially align with the line of the ear of a user in use, said handset being encased in soft plastic material. Conveniently, the handset includes a reinforcing mesh of stiff material encased by said soft plastic material.

Conveniently, the speaker portion is fitted with an ear piece of soft foam like material adapted to be removably secured to said speaker portion such as by clip means.

In a further form of the invention the speaker portion and microphone portion are integrally connected or formed together and pivotally and releasably mounted on the handset body so that movement of the ear piece to align with the user's ear in use will also move the microphone portion relative to said body.

The microphone and ear piece device may include a support arm such that the device can be used as a self-supporting ear phone and microphone set.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in greater detail referring to the accompanying drawings in which figures 1 and 2 show elevation and plan views of one embodiment of the invention

Figures 3 and 4 show an elevation and plan view of a further embodiment of the invention

Figures 5 and 6 show elevational views of further embodiments of the invention, and

Figures 7 and 8 show an elevation and plan view of a further embodiment of the invention.

Figure 9 shows an elevational view of a further embodiment of the handset.

Figures 9A and 9B are partial cutaway views showing two pivotal connections as fitted to a telephone handset.

Figure 10 is a perspective view of a further embodiment of a telephone handset.

Figure 11 is a perspective view of an adaptation of the embodiment shown in Figure 10.

Figure 11A is a side view of the adaptation of Figure 11 in use.

Figure 12 is a perspective view of a further embodiment of a telephone handset.

Figure 12A is a perspective view of a cover member for the handset shown in Figure 12.

Figure 13 is a side view of a further embodiment of a telephone handset.

Figure 14 is a perspective view of a further embodiment of a handset.

Figure 14A is a partial perspective view of the embodiment of Figure 14.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In each of the series of the figures the mouth piece and handle piece 10 and 11 are indicated by common reference numerals and can be considered to have a similar construction. The different embodiments relate in most instances to the provision of a flexing or pivotal ear piece in accordance with the inventive concept.

With reference to figures 1 and 2, the handle 10 has mounted at one end a microphone 11 and at its other end an ear piece 15 which is resiliently or flexibly mounted at 16 to the hand portion 10.

The ear piece 15 has a face engaging portion 12 which may be flexible in the area at or near its end to smoothly engage the users face adjacent his ear.

The ear piece 15 incorporates a speaker 14 and a cap member 13 which may be replaceable and is preferably of soft foam material. The cap members 13 may be easily replaceable and if desired may be produced in various colours.

In use the hand piece engages the users face in the vicinity of the ear on the cheek bone and the ear piece may flex about point 16 in order that the surface of the cap easily aligns with the users ear in use.

With reference to figures 3 and 4, the hand piece may be of conventional construction including hand portion 10, mouth piece 11, with an ear piece 15a.

On the ear piece 15a, a cap member 17 is slidably mounted on the ear piece 15 and attached to the handle piece by a flexible member 18. The arrangement is such that when the hand piece is in use the cap member 17 engages with the users ear and flexes about the connection member 18 to align itself with the users ear.

With reference to figures 5 and 6, these figures show different embodiments of cap members 19 and 21. With reference to figure 5 the cap member 19 is mounted on ear piece 24 in slidable relationship under the influence of a bias spring 20 such that the cap member moves relative to the ear piece 24 under the pressure of application to a users ear to substantially align itself with the users ear in a comfortable position.

With reference to figure 6 the cap member 21 is slidably mounted on an ear piece 23 and incorportes a concertina portion 22 allowing flexibility of movement of the cap member 21 to align itself with the users ear in use.

With reference to figures 7 and 8 the hand piece 10 and microphone portion 11 incorporate a movable microphone mounted upon arm 25 pivotally connected to one end of the handle portion 10 at 26. The ear piece 15 is otherwise manufactured in similar manner to that shown in figure 1 incorporating a cheek bone rest portion 12 and cap member 14.

The arrangement is such that the ear piece and microphone member can pivot about pivot point 26 so that the microphone remains adjacent the users mouth whilst the cap member is aligned with the users ear.

In other words the microphone or ear piece remains aligned with the ear independantly of the movement or disposition of the handle portion.

With reference to Figures 9, 9A and 9B, there is shown a handset 30 including a microphone portion 31, a pivot connection 32 and speaker or ear piece portion 33.

Figures 9A and 9B show in more detail two embodiments of the pivotal connection between the ear piece 33 and the body of the handset 30.

With reference to Figure 9A, the pivotal connection 32 includes a shaft 34 mounted on shoulders 36 connected to the speaker portion 33.

The speaker portion 33 includes a further shaft 35 extending perpendicularly to shaft 34. This enables the speaker portion to rotate about two pivot points to allow universal movement of the ear piece relative to the body 30.

With reference to Figure 9B, the ear piece 33 is mounted upon a shaft 37 mounted in slots 39 in the body of the handpiece.

The shaft is biased by a compression spring 38 to a stable position in the slots 39 but is sufficiently pliable to allow movement of the ear piece 33 to align itself substantially with the line of a user's ear in use.

Referring to Figure 10, there is shown a handpiece 40 having a housing slot 41 in which an ear piece and microphone 42,43 are mounted in pivotal fashion about a pivot point 44 in the housing.

The ear piece 42 includes a soft pad 43 for contact with the ear of a user. The pivot point 44 allows pivotal movement of the ear piece and pad 42,43 and concurrently with any movement of the ear piece the microphone portion 41 and associated arm 41a as shown in phantom outline also is moved to maintain the position of the micrphone relative to the mouth of the user whilst aligning the pad on the piece with the ear of the user.

The microphone portion 41, ear piece 42 and arm 41a are removable from the body 40 and can be utilised as a separate headphone set as shown in Figure 11A.

With reference to Figure 12, a handset body 50 is provided with an ear piece 51, microphone 52 and soft padding material 53 over the ear piece to enclose the speaker.

The ear piece 51 is mounted at the top of the body by a pivoting ball joint 54 to allow universal movement of the speaker portion and cap relative to the user's ear. The microphone portion is shown fitted with a sheath 55 for fitment over the microphone portion and handset body to protect the body and also to enable decoration of the body with different coloured materials.

With reference to Figure 13, this shows a soft pad material 60 fully enclosing the speaker portion 61 mounted on the handset 62 fitted with a microphone 63. The pad material 60 is of foam like material to allow flexing of the material relative to the ear of a user when pressed against the ear to allow substantial alignment with the line of the ear of the user.

With reference to Figures 14 and 14A, the handset body 70 is fitted with a microphone 71, speaker portion 72 and a freely pivoting portion 73. The body portion is encased with a tough plastic mesh material 74 which in turn is coated with soft plastic material forming a totally enclosing outer shell 75 over the body portion of the handset.

The speaker portion is preferably fitted with a sound proofed ear piece 76 as best shown in Figure 14A wherein the ear piece material can be clipped by legs 77 over the speaker portion 72 of the handset.

It will be appreciated that the handpiece of the present invention incorporating a speaker portion and microphone portion is both a functional device having an ergonomic shape and operation which is able to inter-react with the user in a comfortable practical manner without loss of aesthetic appearance.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A telephone handset having a body comprising a speaker portion, microphone portion, and a handle portion joining said speaker and microphone portions, wherein said speaker portion includes an ear engaging portion which is pivotally or flexibly supported relative to said handle portion, such that in use the speaker portion is maintained substantially aligned with a users ear irrespective of the location of the hand piece.

2. A telephone handset having a body comprising a speaker portion, microphone portion, and a handle portion is flexed, or hinged, or universally movable in relation to a users ear in use.

3. A telephone handset as claimed in claims 1 or 2, comprising a speaker portion and microphone portion adapted for connection to a telecommunications system to allow a conversation wherein the handset comprises a speaker portion which in use remains in constant seal to the ear of the user by incorporating a movable mechanism between handle portion and a speaker portion.

4. A telephone handset as claimed in any preceding claim wherein constant seal to the ear of the user is achieved by incorporating a movable plate between the speaker housing and the speaker portion.

5. A telephone handset as claimed in any preceding claim wherein the speaker portion incorporates a flexible soft pad which on contact with the ear will angle away from the head of the user to follow the natural line of the ear.

6. A telephone handset as claimed in any preceding claim comprising a speaker portion which is pivoted or affixed at any point on the upper, lower, or side surfaces or speaker portion or speaker housing or handle portion to allow movement when in use.

7. A telephone handset as claimed in any preceding claim comprising a speaker portion which is pivotally affixed in an area between and including the front and rear sections of speaker portion or speaker housing or handle portion.

8. A telephone handset as claimed in any one of the preceding claims comprising a permanent or replaceable soft pliable surface or pad is incorporated on the outer surface of speaker portion to make contact with the ear.

9. A telephone handset as claimed in any one of the preceding claims wherein a pivot/pressure point is located to the front of the ear.

10. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion is pivotable or rotatable laterally.

11. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion incorporates a flexing soft pad which on contact with the ear will reposition to angle away from the head of the user to follow the natural line of the ear.

12. A telephone handset as claimed in any one of claims 1 to 10 wherein the speaker portion incorporates a pad having hard or soft material.

13. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion is further shaped to fit around and substantially envelope the ear and is adapted to pivot in use to rest against the skull of the user, by utilising either a soft material pad or mechanical joint.

14. A telephone handset as claimed in any one of the preceding claims wherein the telephone handset is manufactured from a non-rigid, pliable material.

15. A telephone handset as claimed in any one of the preceding claims wherein the hand-grip is provided in a variety of sizes, colours, textures and material.

16. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion and microphone portion is pivotable and is detachable to function as an independent telephone headset.

17. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion and a cheek rest portion flexes in unison.

18. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion flexes and the handset incorporates an abuttment which rests on the cheek.

19. A telephone handset as claimed in any one of the preceding claims wherein a rubberized/soft plastic area is included to protect the hand set from damage.

20. A telephone handset as claimed in any one of the preceding claims wherein the speaker portion, microphone portion, and handle portion is connected to a movable arm portion incorporting a microphone portion.

21. A telephone handset having a body comprising a speaker portion, a microphone portion and a handle portion joining said speaker and microphone portions wherein the speaker portion includes an ear engaging portion which is flexibly supported relative to said handle portion, the said body portion including a plastic mesh reinforcement encasing the body, said reinforcement being covered with soft plastic material covering the outer shell.

22. A telephone handset as claimed in claim 21, wherein a soft plastic ear piece portion is attached to the speaker portion in a snap action fit.

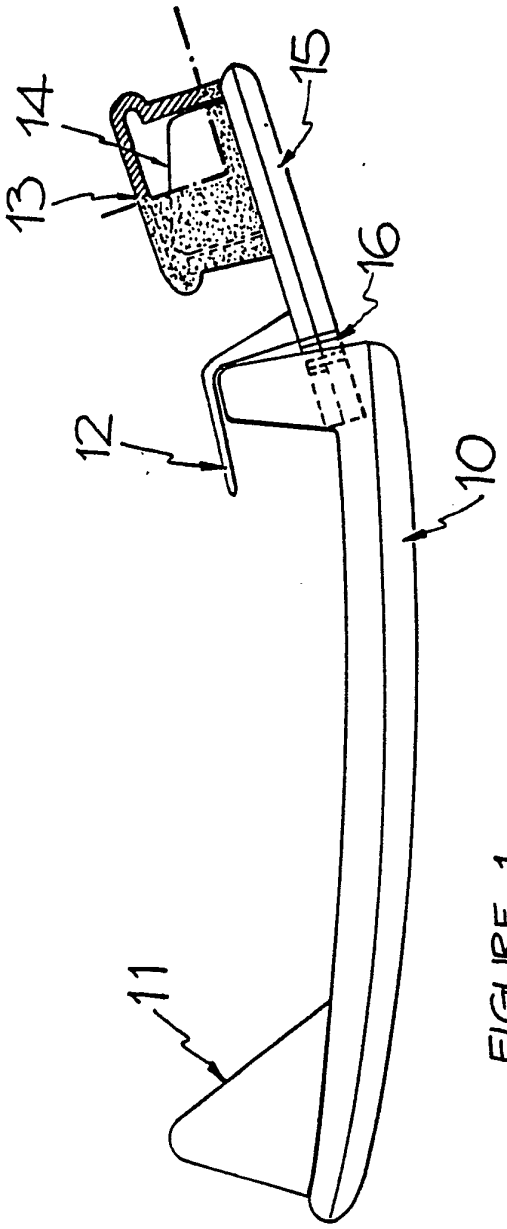


FIGURE. 1

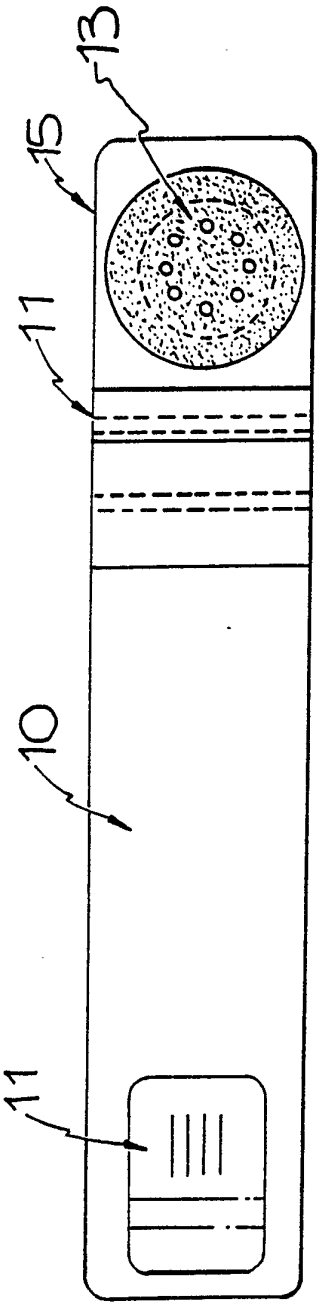


FIGURE. 2

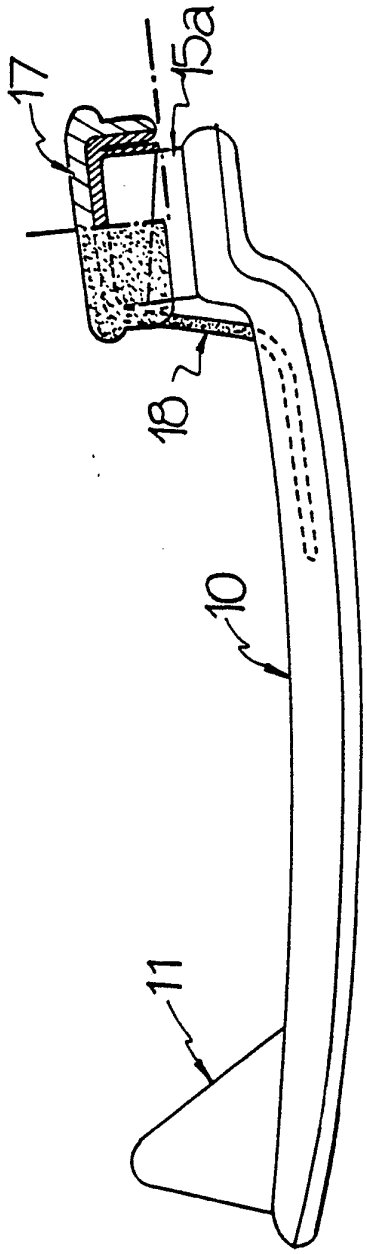


FIGURE. 3

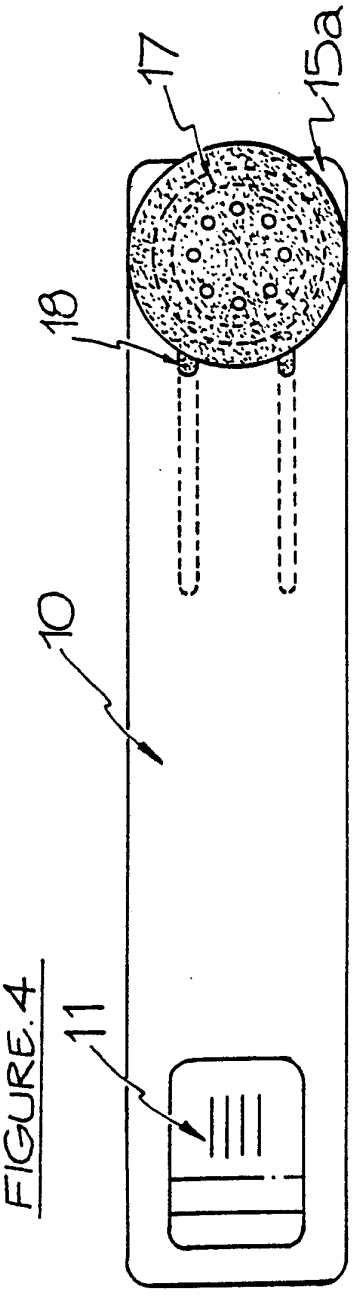


FIGURE. 4

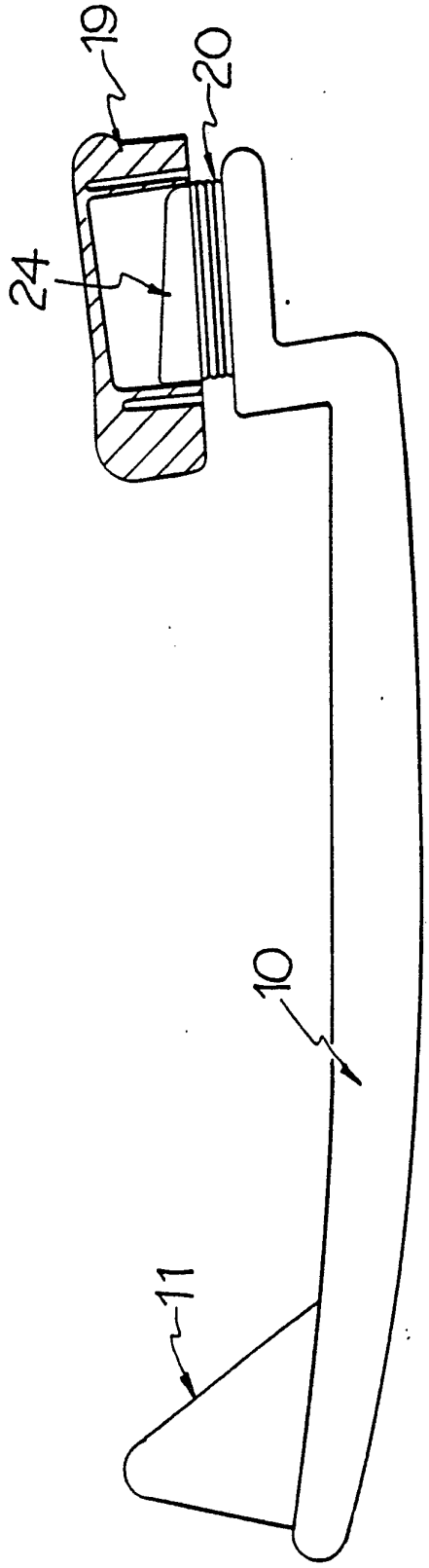


FIGURE.5

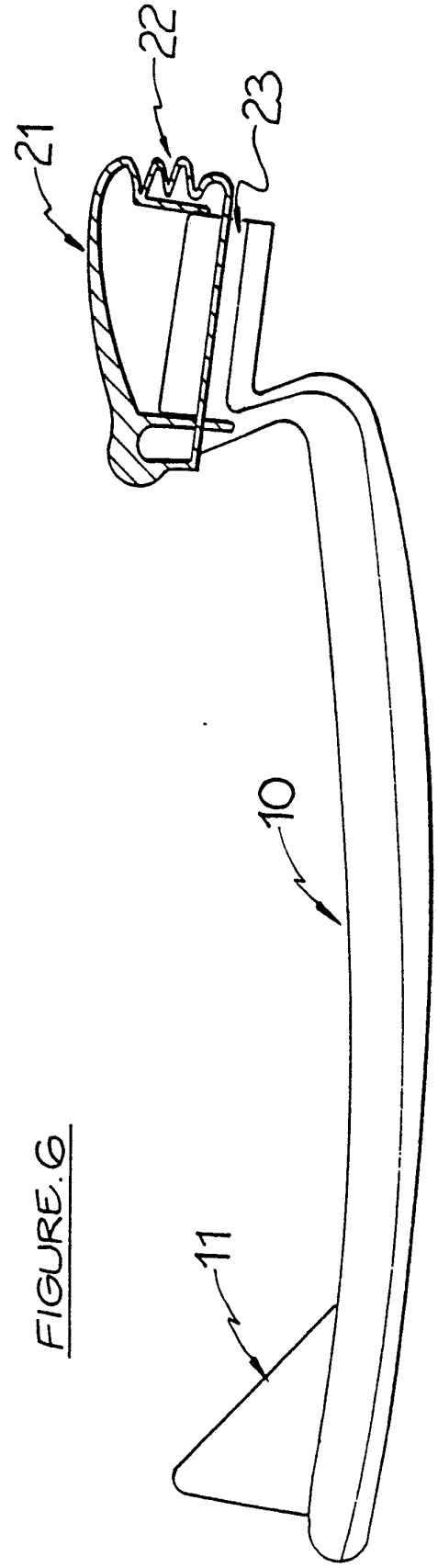


FIGURE.6

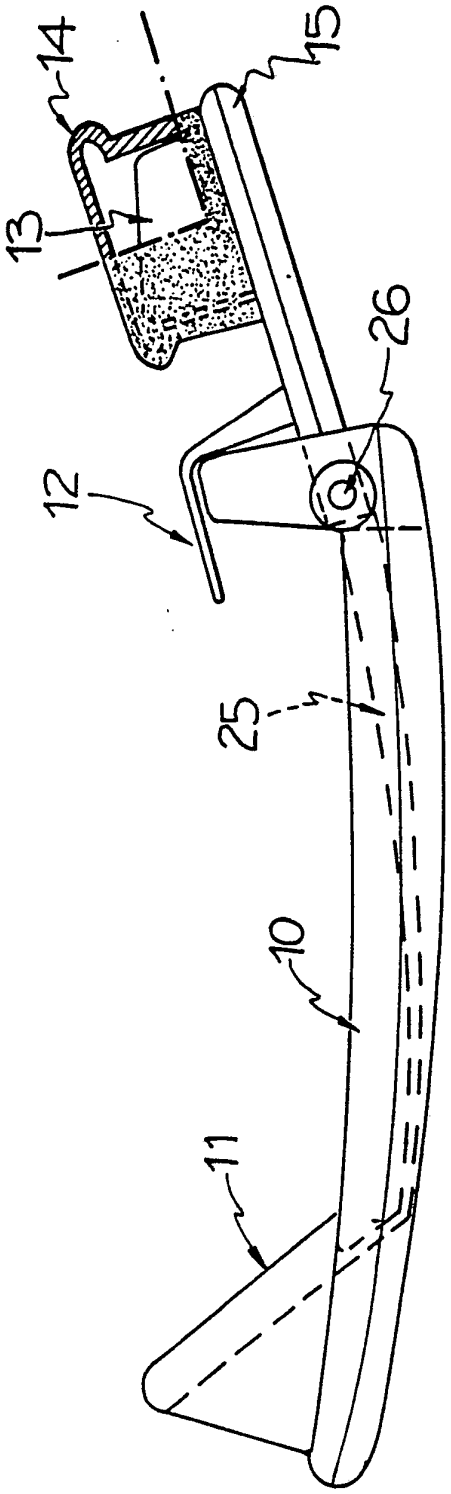


FIGURE.7

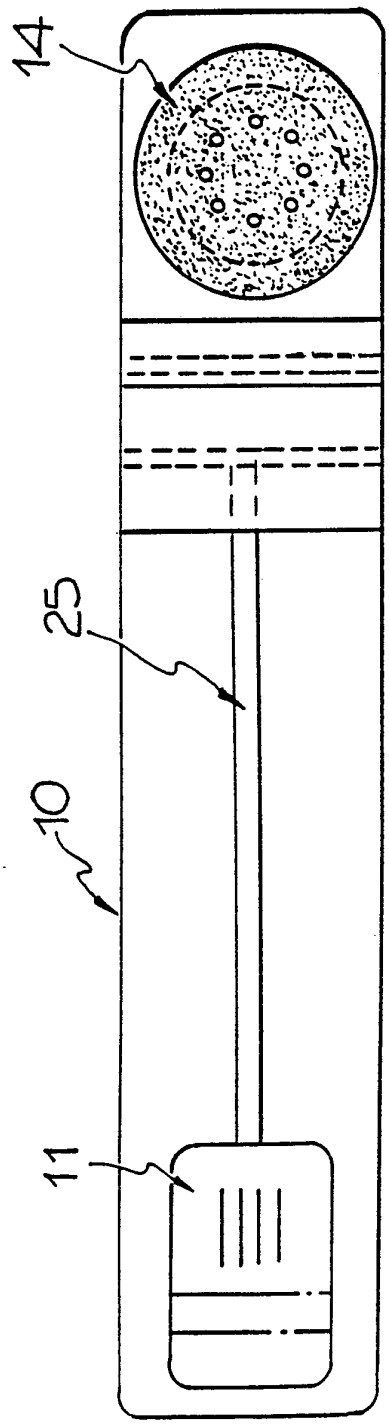


FIGURE.8

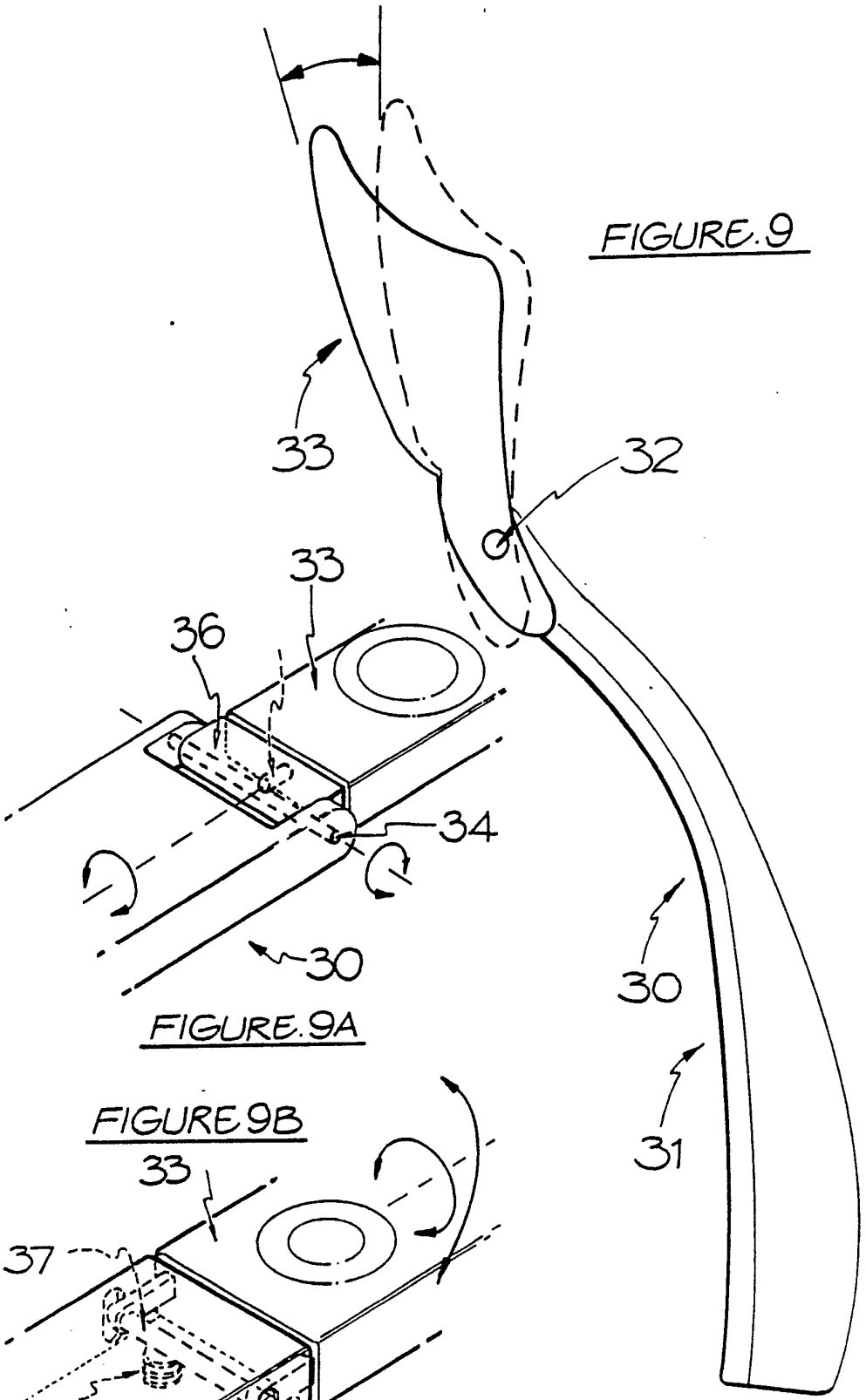
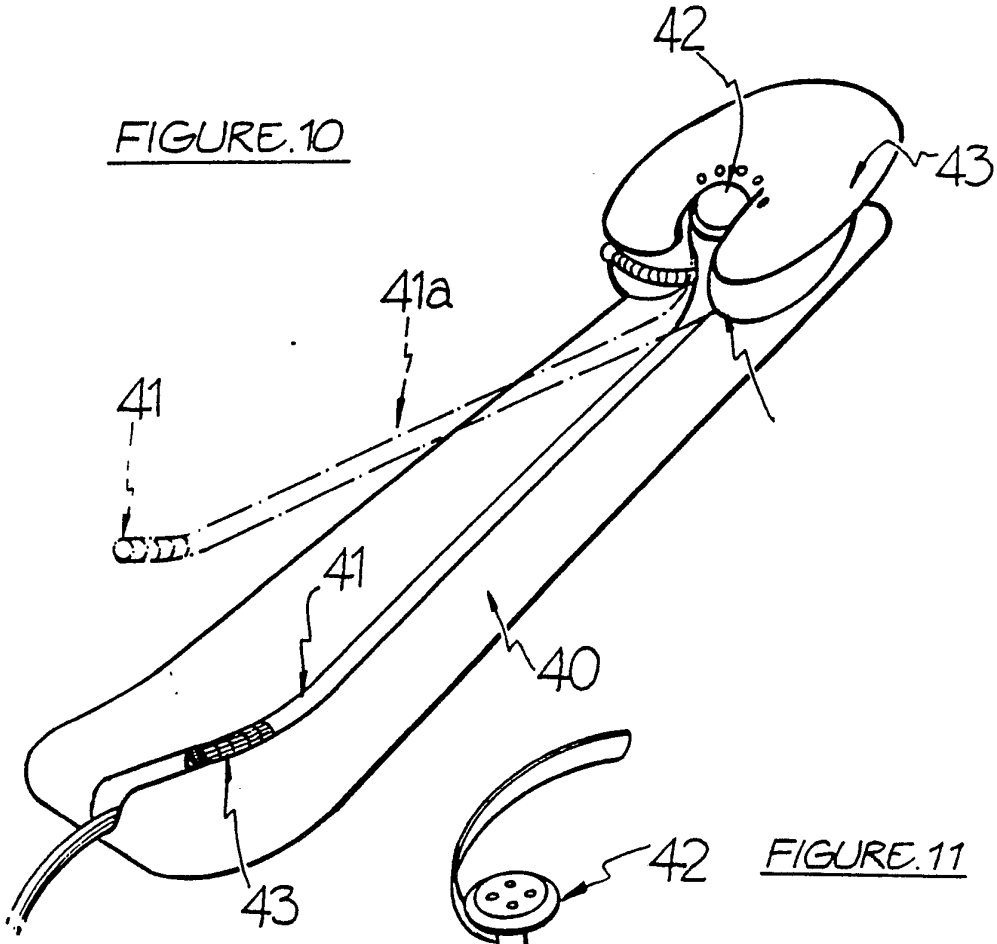


FIGURE.9

FIGURE.9A

FIGURE 9B

FIGURE.10



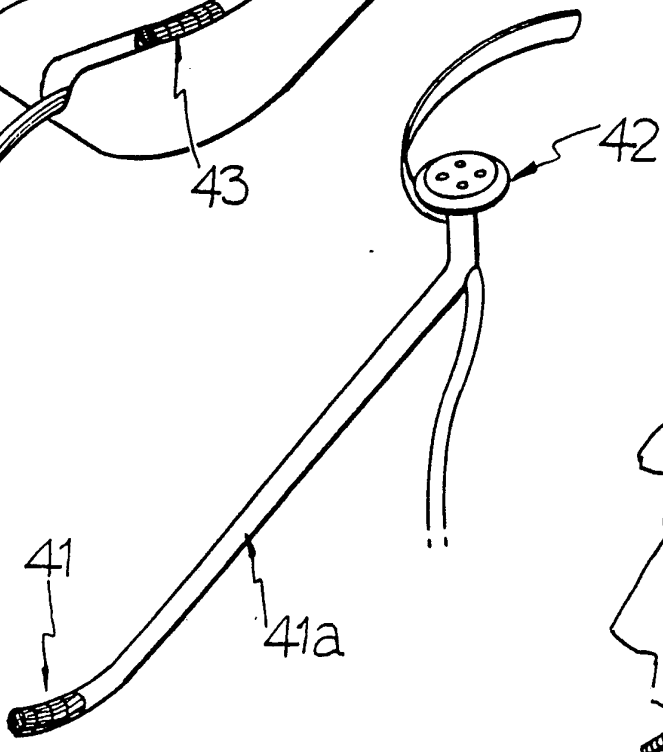


FIGURE.11

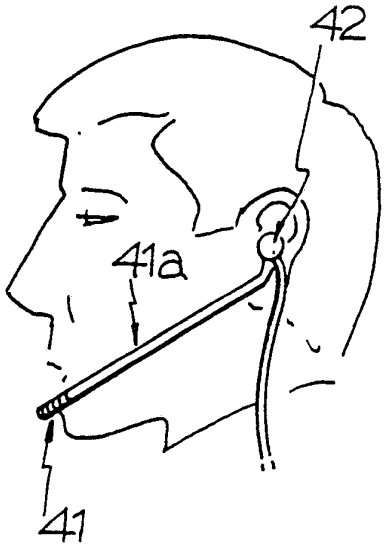


FIGURE.11A

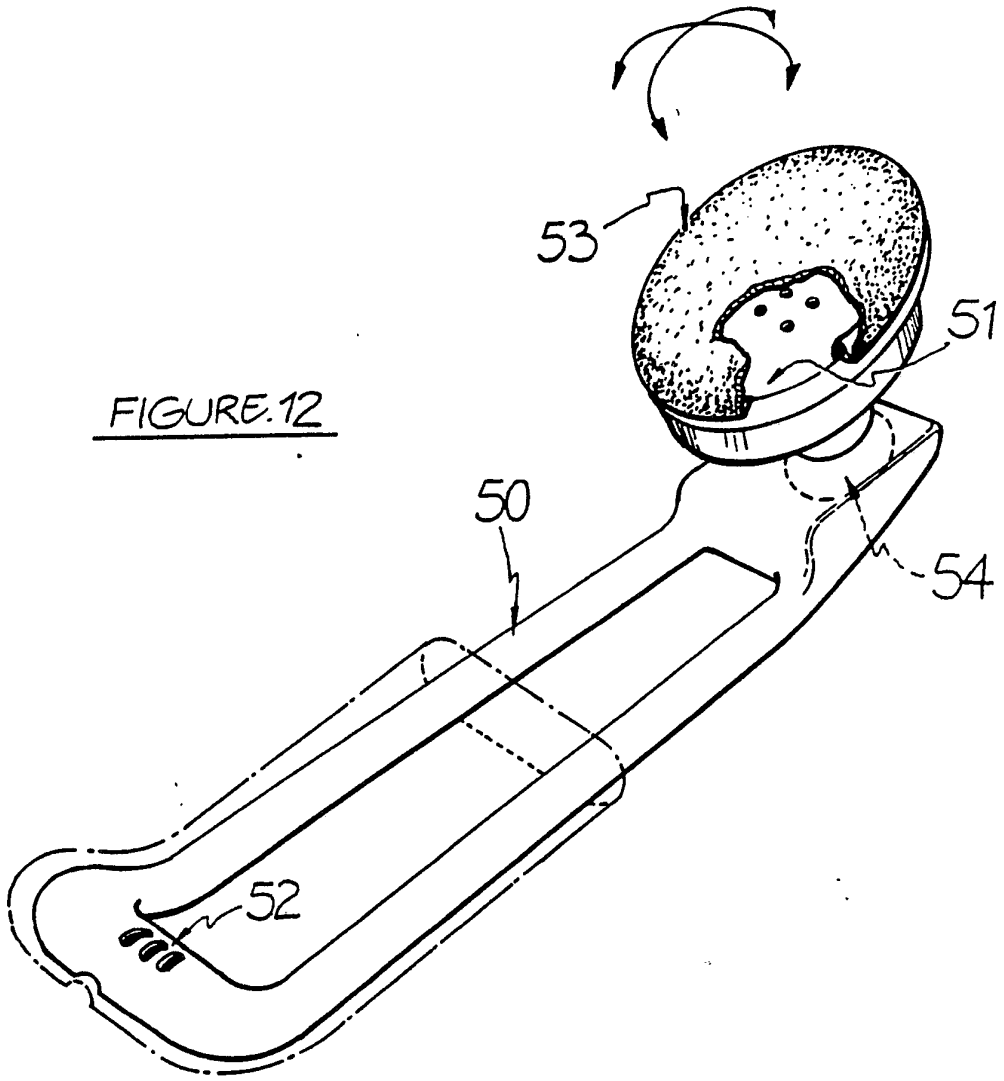


FIGURE.12

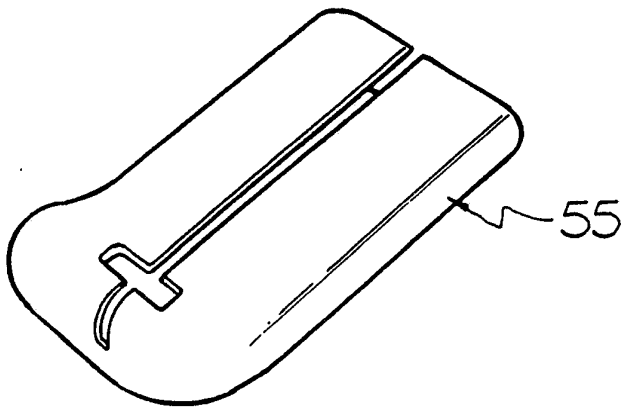
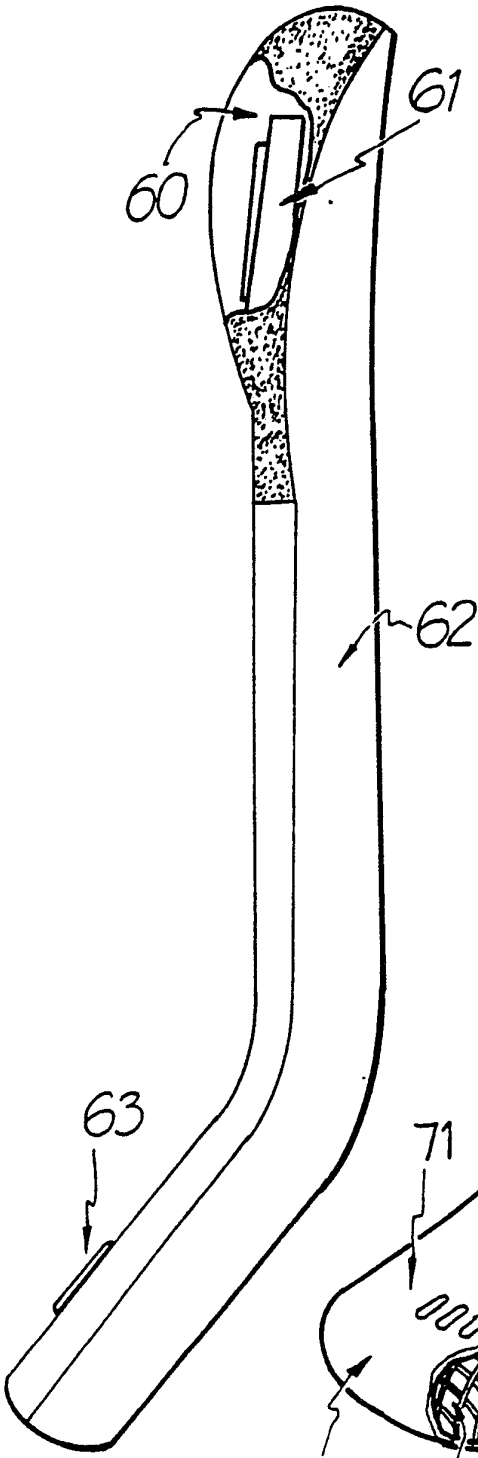


FIGURE.12A

FIGURE. 13



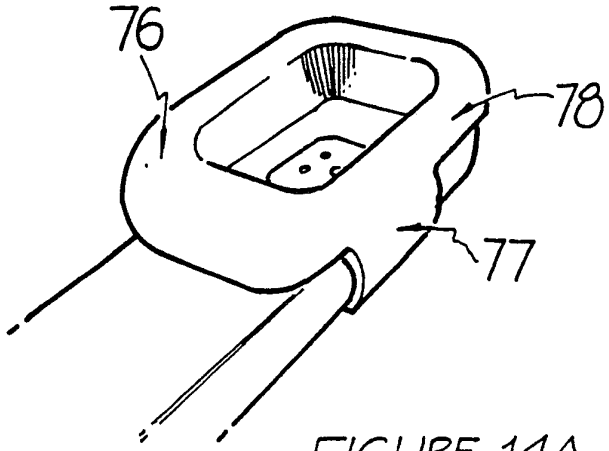


FIGURE. 14A

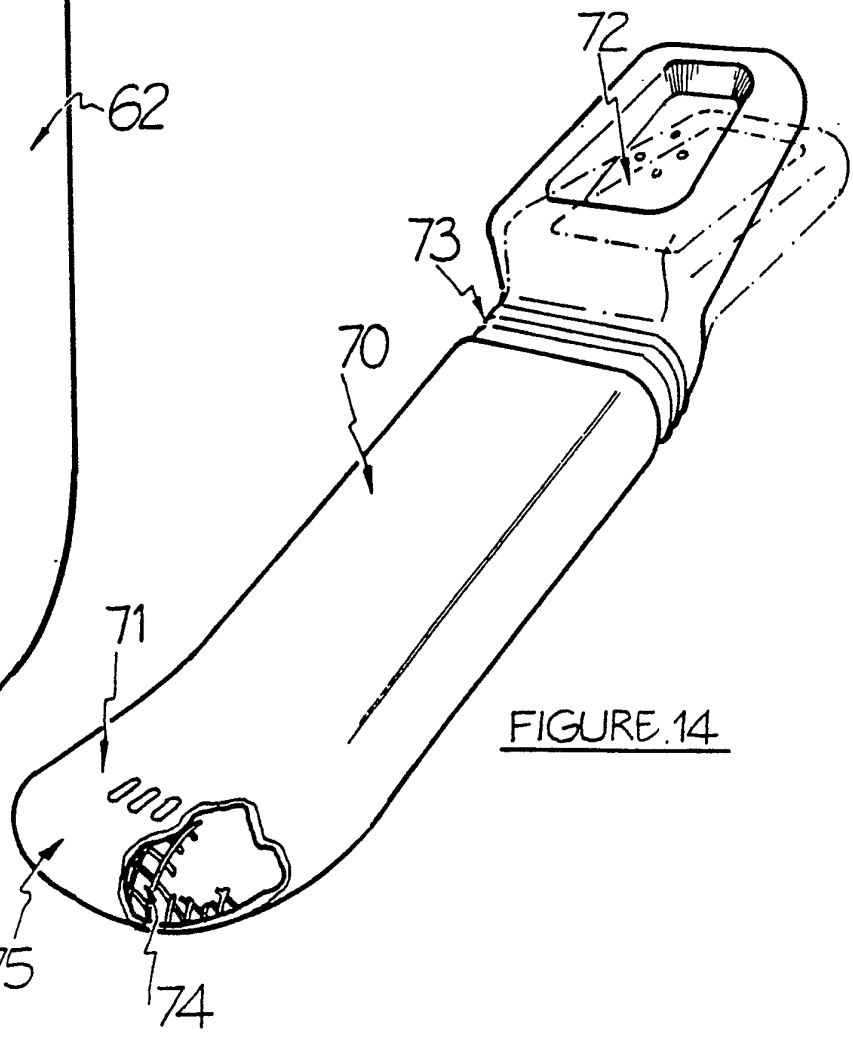


FIGURE. 14

IN' 'RNATIONAL SEARCH REPO:

International Application No. PCT/AU 89/00129

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 6

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[4] H04M 1/03

II. FIELDS SEARCHED

Minimum Documentation Searched 7

Classification System	Classification Symbols
IPC	H04M 1/02, 1/03

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 8

AU:IPC as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT 9

Category*	Citation of Document, 11 with indication, where appropriate, of the relevant passages 12	Relevant to Claim No 13
X	AU,A 75138/87 (MARKS) 17 December 1987 (17.12.87)	1-3,5-9,11-15 17-19,21,22
P,X	EP,A 262915 (WILLIAMSON) 6 April 1988 (06.04.88)	1-3,5-15,19-21
P,X	US,A 4754484 (LARKIN ET AL) 28 June 1988 (28.06.88)	1,2,5,6,8,9,11,12 14,15,19,21
X	US,A 1899046 (NICHOLS ET AL) 28 February 1933 (28.02.33)	1-3,6,7,9,10,14,15 19,21
X	AU,B 378/48 (129902) (SIEMENS BROTHERS AND CO LTD) 28 November 1946 (28.11.46)	1-4,6,9,14,15,19,21
X	GB,A 1212389 (INTERNATIONAL STANDARD ELECTRIC CORPORATION) 18 November 1970 (18.11.70)	1-3,6,7,9,14,15,19 21
X	GB,A 1526491 (ELMEG ELEKTROMECHANIK GMBH) 27 September 1978 (27.09.78)	1-3,6,7,9,14,15,19 21
X	GB,AO 2201861 (STC plc) 1 April 1987 (01.04.87)	1-3,6,7,9,14,15,19 21
X	US,A 4092502 (JONES) 30 May 1978 (30.05.78)	1-3,6,14,15,19,21

* Special categories of cited documents: 10

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

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"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

"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

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
23 JUNE 1989 (23.06.89)	3 July 1989
International Searching Authority	Signature of Authorized Officer
Australian Patent Office	E.N.PERRIS