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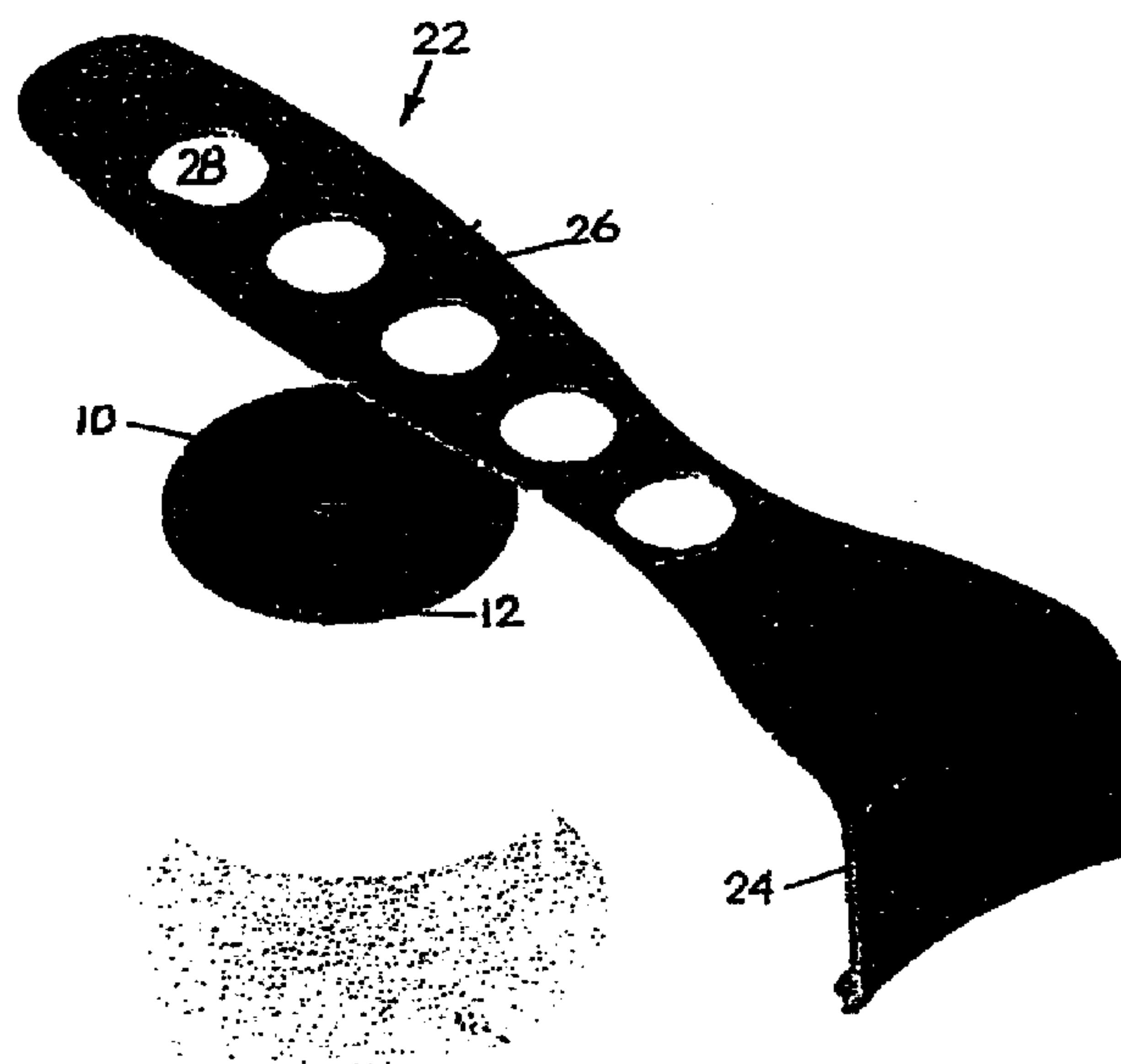
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(54) **SYSTEME ECARTEUR UTILISE LORS D'OPERATIONS  
CHIRURGICALES**

(54) **RETRACTOR SYSTEM USED IN SURGICAL OPERATIONS**



(57) L'invention concerne un système écarteur conçu pour être utilisé en chirurgie, présentant différentes parties combinées. Ce système comprend un téton auxiliaire (10) présentant une plaque de base (12) et une pastille adhésive (14) placée dessous. La pastille adhésive permet de coller le téton (10) sur la peau du patient ou sur un champ opératoire (30), ce qui permet de fixer un écarteur (22) conçu pour tirer vers l'extérieur et pour maintenir les bords d'une incision. Le système combiné comprend également un anneau auxiliaire (18) présentant un certain nombres de tétons auxiliaires (20) fixés et placés sur la périphérie. Ces tétons sont placés sous le drap chirurgical (30), avant l'opération, et traversent une ouverture dans la pastille adhésive (32), de manière que les tétons se trouvant sur l'anneau auxiliaire soient dirigés vers le haut à travers des orifices ménagés dans le champ opératoire. Les écarteurs (22) peuvent être fixés aux tétons (20) pour permettre de tirer vers l'extérieur et de maintenir les bords d'une incision.

(57) Retractor system to be used in surgery, and with separate parts in combination, comprising an assistance nipple (10) with a base plate (12) and an adhesive patch (14) underneath, for attachment to the patient's skin, or on a surgical sheet (30) to the nipple (10), for fastening of a retractor (22) for retracting outwardly and fastening of the edges of an incision. In the combined system is also comprised an assistance ring (18) with a number of attached, peripherally placed assistance nipples (20) which, prior to surgery, are placed underneath the surgical sheet (30) and across an opening in the adhesive patch (32), so that the nipples on the assistance ring point upward through holes in the surgical sheet, and retractors (22) can be fastened to the nipples (20) for outwardly retraction and fastening of the edges of an incision.



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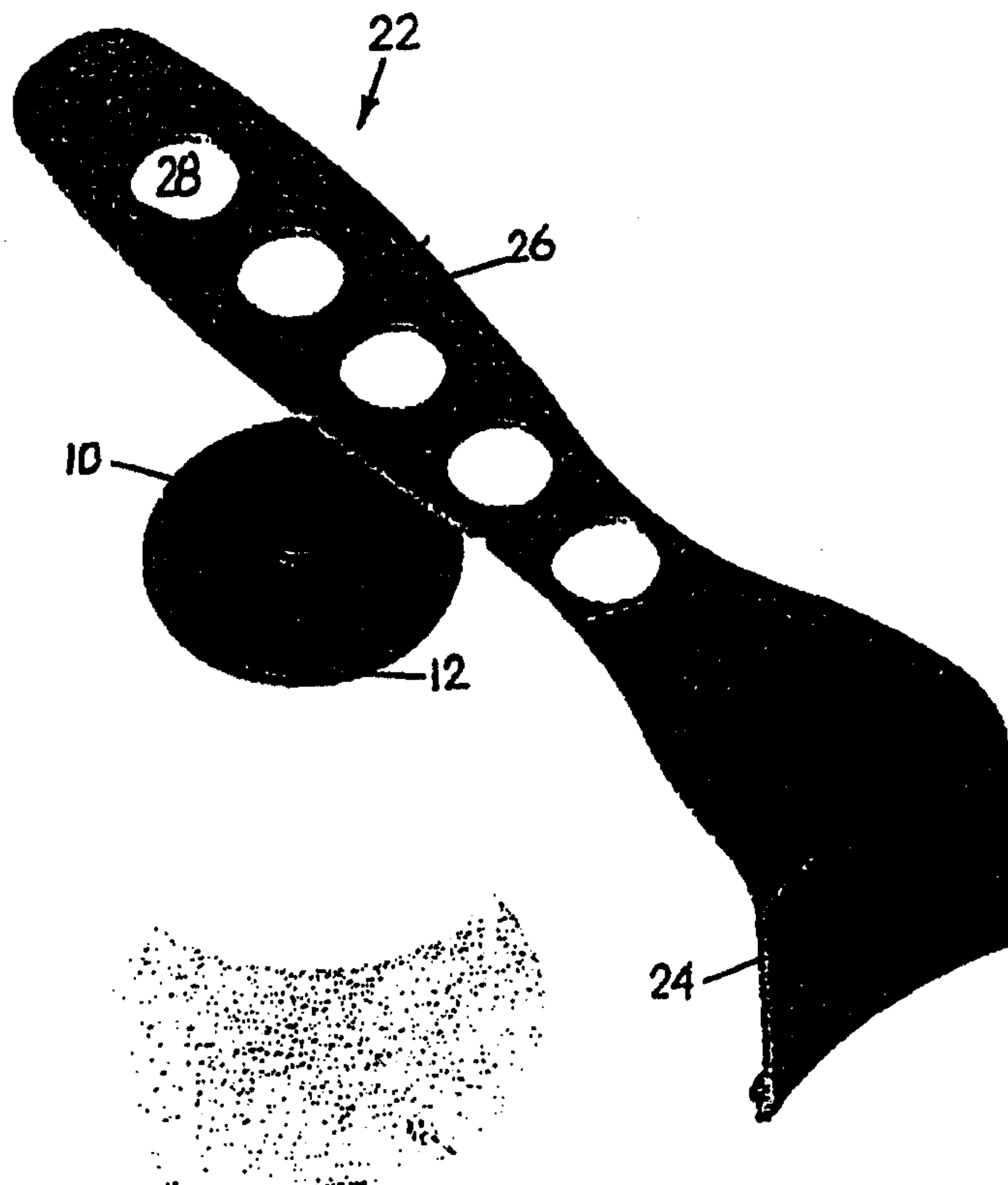
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/NO98/00211 (22) International Filing Date: 16 July 1998 (16.07.98) (30) Priority Data: 973321 18 July 1997 (18.07.97) NO (71)(72) Applicant and Inventor: PETERSVIK, Alf [NO/NO]; Boks 301, N-6151 Ørsta (NO). (74) Agent: LASSEN, Egil; Actio-Lassen A.S., Boks 14, N-5061 Kokstad (NO).		(81) Designated States: AU, CA, CN, JP, KP, NZ, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Norwegian).</i>

(54) Title: RETRACTOR SYSTEM USED IN SURGICAL OPERATIONS

## (57) Abstract

Retractor system to be used in surgery, and with separate parts in combination, comprising an assistance nipple (10) with a base plate (12) and an adhesive patch (14) underneath, for attachment to the patient's skin, or on a surgical sheet (30) to the nipple (10), for fastening of a retractor (22) for retracting outwardly and fastening of the edges of an incision. In the combined system is also comprised an assistance ring (18) with a number of attached, peripherally placed assistance nipples (20) which, prior to surgery, are placed underneath the surgical sheet (30) and across an opening in the adhesive patch (32), so that the nipples on the assistance ring point upward through holes in the surgical sheet, and retractors (22) can be fastened to the nipples (20) for outwardly retraction and fastening of the edges of an incision.





# RETRACTOR SYSTEM USED IN SURGICAL OPERATIONS

The invention concerns a system for combined use of retractors and surgical sheets used for keeping a field of surgery in clear view during surgery in process. Thus, the invention concerns a system of the above-mentioned kind, comprising also an assistance nibble and an assistance ring, with a number of nipples for fastening of retractors in the decided position.

It is known, for instance during abdominal surgery, to use retractors which retract the edges of an incision apart, keeping them separated, so that the field of surgery is accessible and with unimpaired view. Previously, retractors were kept manually in desired position by surgeon assistants who also had to attend when the surgeon requested adjustment of the retractors' position. Use of retractors was therefore awkward, partially strenuous and time-consuming as well as costly, due to the need for participating assistants. When used for long periods of time, it was also difficult to keep the retractors constantly in the desired position, due to variations in tension, and due to fatigue in the assistant(s).

In order to simplify the use of retractors, and decrease the need for participation from assistants, it has previously been suggested various devices for non-manual fastening of retractors and for adjustment of their position. However, it is common for all known devices that they are costly, and with complicated construction, and that they usually require two hands for

positioning on a patient, and for being adjusted into position. It is also a drawback that these devices unintentionally may be brought out of position, and thus inflicting complications in ongoing surgery.

US-patent 2493598 concerns a canvas mat to be positioned over a patient's abdomen, with a relatively wide, circular opening, covering the operation area. Along the mat's longitudinal edges are straps for fastening to the lower edges of the operation table. A number of peripherally positioned retractors alongside the mat's central opening may be strapped to the opening's reinforced inner edge. The device shows none of the characteristic steps in the present invention.

US-patent 3998217 describes a flat, ring-shaped frame with four outwardly pointing peripheral support flanges, each having two fixed pegs for insertion into retractor shaft holes, through which each of four retractors may be locked in the desired position. The device is markedly different from the present invention, in which is included also retractors made from special plastic.

US-patent 5052374 describes a flat, elliptical frame to be positioned around an operation area having a number of peripheral holes. Through the holes, a number of gripping instruments and a hook instrument may be attached, for detachment with the frame. In each gripping instrument is included an upper and a lower gripping jaw, each of which are forced against one another by means of a spring, for fastening of slippery, organic tissue in the operation area. No characteristics steps present in the present invention are shown.



DE-Off.Schr. 1566069 describes a flat and slightly curved frame for positioning around an operation area, and having, on its upper side, pegs for insertion into suitable holes in retractor shafts, enabling the retractors being adjustably locked into position, in relation to the operation area. No characteristics similar to the present invention are shown.

From the summary above may be deducted that there exists a need for a retractor systems, suitable for use during surgery, and which will satisfy the requirement that need to be fulfilled by the system in question.

A suitable system of this kind must include an assistance nipple of the new type, for fastening into position on the patient's body, for fastening of a retractor, enabling retraction and fastening the edges of an incision in an operation area, where the retractor may be moved and adjusted into position using only one hand, as well as a mainly flat assistance ring, for positioning around an operation area, having mounted assistance nipples of the above-mentioned type for insertion into holes in the retractor shafts, so that the retractors may be replaced into different positions, allowing the incision edges to be retracted and fastened into different positions in relation to the operation area. These positions must be adjustable, through repositioning of the retractors by use of one hand only, so that the assistance nipples on the assistance frame may be inserted into other shaft holes. The assistance frame is used in combination with a surgical sheet, having an opening for the operation field. Both the assistance nipples, as well as the assistance ring and the retractors having shafts

with holes are made from non conductive, acid and impact resistant plastic material. Retractors, assistance nipples and assistance rings made from said material are not known beforehand, and are therefore novel, separate elements in combination according to the invention's system.

A requirement for use is also that the system's single parts easily may be cleaned and sterilized for use.

According to the invention, a retractor system has been presented, and it is characterized in the claims below.

Reference is made to the drawings, where

- Figure 1** shows a plan drawing of an assistance nipple according to the invention
- Figure 2** shows a plan view of the nipple according to figure 1
- Figure 3** shows a plan view of a plastic retractor according to the invention
- Figure 4** a plan view from above, showing a surgical sheet in combination with a plastic assistance ring according to the invention
- Figure 5** an enlarged plan view of the assistance ring with attached nipples according to the invention

- Figure 6a** shows, in perspective, a plastic retractor and a plastic assistance nipple in perspective with adhesive patch according to the invention
- Figure 6b and 6d** shows the retractor and assistance nipple in perspective and seen from above
- Figure 6c and 6e** shows the same parts in perspective and seen from below
- Figure 7a** shows in perspective a plastic retractor with plastic assistance ring and surgical sheet with adhesive patch according to the invention
- Figure 7b and 7d** shows the parts according to figure 7a in perspective and seen from above
- Figure 8a** shows in perspective an assistance ring with retractor according to the invention
- Figure 8b and 8d** shows the same parts in perspective and seen from above
- Figure 8c and 8e** shows the same parts in perspective and seen from below
- Figure 9** shows a single assistance nipple in use
- Figure 10** shows an assistance nipple in use.



The depicted retractor system "Easyhold" according to the invention comprises, in a preferred embodiment of the invention, an assistance nipple 10 made from non conductive, acid, heat and impact resistant plastic material, made in one piece, with a base 12, attached underneath with an adhesive patch 14 for fastening to the skin of a patient, for instance in preparation to abdominal surgery. By means of a plastic retractor 22 according to the invention, the edge of an incision may be retracted outwardly to the extent desired, so that the operation area is accessible and in clear view. The retractor is kept in position by one of several holes 28 in the retractor shaft 26 being pulled over the outwardly protruding assistance nipple 10. The retractor 22 may, if necessary, be repositioned, by detaching the shaft 26 from the assistance nipple 10 and selecting and pulling a different shaft hole 28 over the nipple 10, all by using only one hand.

In the system according to the invention is also included an assistance ring 18 of the above-mentioned special plastic material, having a number of mounted assistance nipples 20, as well a one or several retractors 22, also being made from special plastic material, another kind shown in figure 3. The retractor 22 comprises a gripping part 14, and a shaft 26 with several holes 28 for attaching assistance nipples 10 and 20 respectively, for fastening of the retractor.

By means of the plastic retractor(s) 10 (22) according to the invention, the edges of an incision may be pulled outwardly to a desired extent so that the operation area is assessable and in clear view. The retractor is kept in position by one of several holes 28 in the retractor shaft 26 being pulled over the outwardly



protruding assistance nipple 10 or 20. The retractor 22 may, if necessary, be repositioned, by detaching the shaft 26 from the assistance nipple 10 and selecting and pulling a different shaft hole 28 over the nipple 10 (20), all by using only one hand.

Further, the system includes a plastic surgical sheet 30 with a middle opening surrounded by a number of peripheral holes arranged to have the same distance from one another as the nipples 20 on the assistance ring 18 and with an adhesive patch 32 beneath, having a middle opening, corresponding to the opening of the surgical sheet 30 and of the assistance ring 18 for use and preparation to an operation the assistance ring 18 is placed underneath the opening of the surgical sheet, and on top of the opening of the adhesive patch, where by the adhesive patch is fasten to the patient's skin with the opening placed around the operation field and with the nipples 20 on the assistance ring 18 protruding upwards through the holes of the surgical sheet 30. The retractor 22 may thereafter be attach to the assistance ring nipples, in the decide position according to the operational field. The retractors positioning my also be adjusted through use of one hand only.

Advantages to be mentioned in the invention are that the single parts of the system are made preferably from non conductive, impact, acid and heat resistant plastic material which easily may by cleaned and sterilized for reuse, and which will decrease the risk of the patient suffering wounds by use of diathermia and a possible subsequent infection. The need for personal use for keeping retractors in the desired position during surgery in progress is no longer required.

Assisting surgery personnel may instead perform other operations at the same time, which are not static, and do not cause occupationally related injuries. The total time required for different types of surgery may therefor be reduced. All of the above may result in sick leaves caused by injuries in surgery personnel, reduced health insurance costs, and not least, in decreased waiting time for patients in need of surgery, thereby improving the overall economy in society.



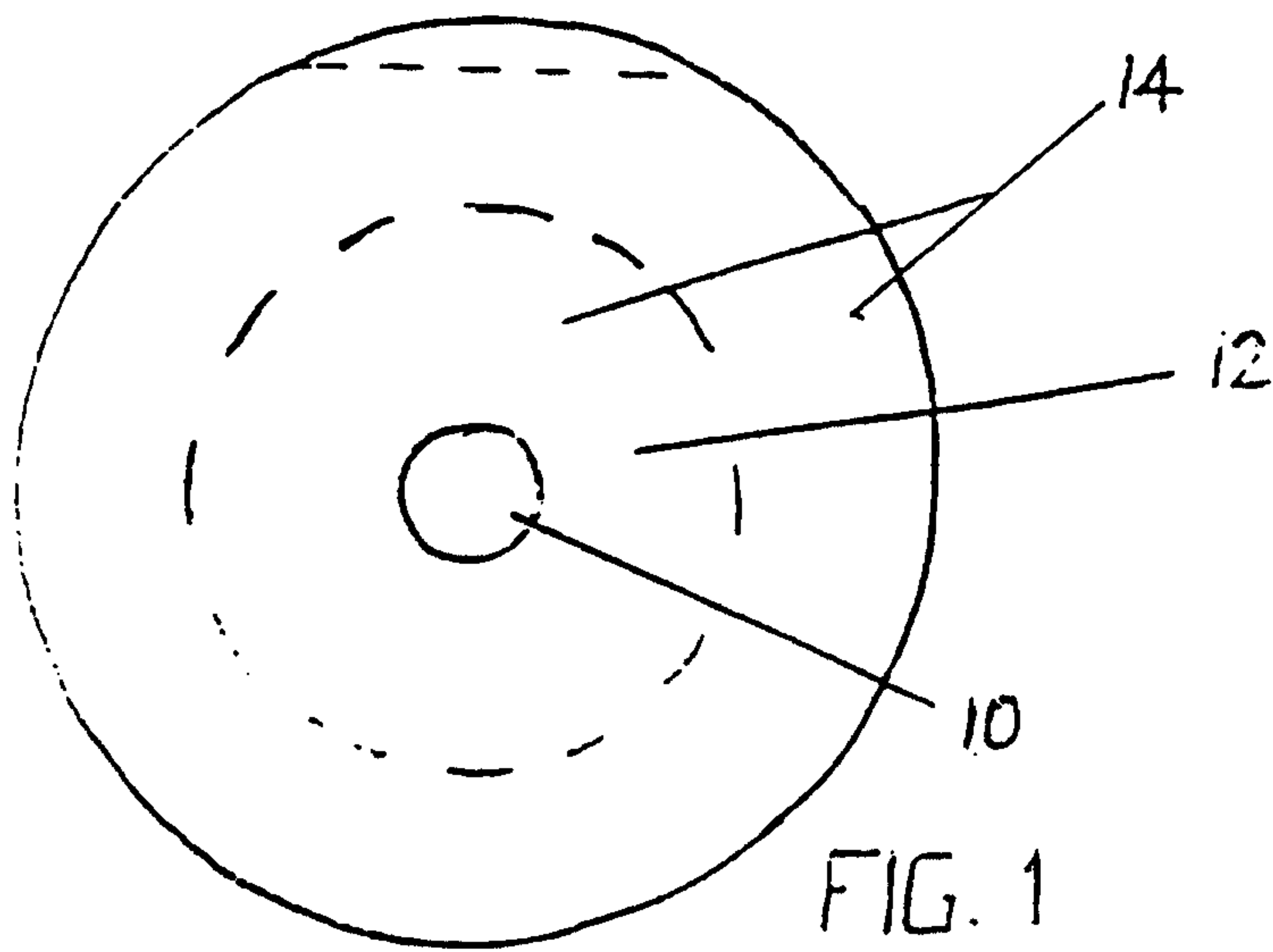
## ***CLAIM***

- 1.*** Retractor system for use in surgery, *characterized in* a combination of single parts preferably made by non conductive, impact, acid and heat resistant special plastic, comprising an assistance nipple (10) made from one piece, with a plate underneath (12), having an adhesive patch (14) at its lower surface for fastening to the skin of a patient or on a surgical sheet, a retractor (22) with a gripping part (24) and a shaft (26) with a number of holes (28), for outwardly retracting of edges of an incision and fastening in this position by the nipple (10) being brought into encroachment with one of the shaft holes (28), as the retractor's position may be adjusted by detaching the assistance nipple (10) from the retractor's shaft and being inserted into another shaft hole (28), an assistance ring (18) with mounted, peripheral and evenly distributed assistance nipples (20) which may be brought into and out of encroachment with the retractor's shafts hole (28) for retracting and fastening of edges of an incision, and surgical sheet (30) with an opening and an underlying adhesive patch (32), also having an opening corresponding to the assistance ring's opening, with the adhesive patch, in preparation of surgery, is fasten to the patient's skin with the opening over and around the field of operation, and the assistance ring (18) being placed over the opening of the adhesive patch and below the opening of the surgical sheet, with the assistance nipple (20) protruding upwardly through the holes

around the surgical sheet's opening, ready for insertion into the shaft hole (28) on retractor's (22), for retracting and fastening of edges of an incision, where the combined single parts are arranged for being operated by use of one hand only.



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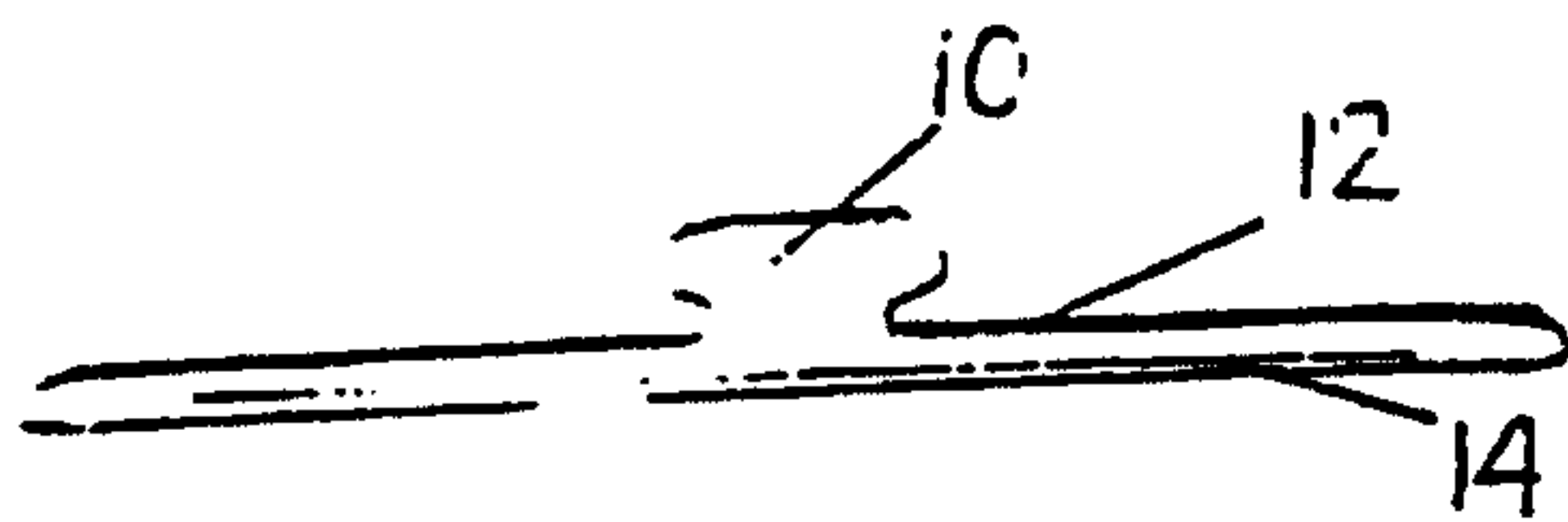
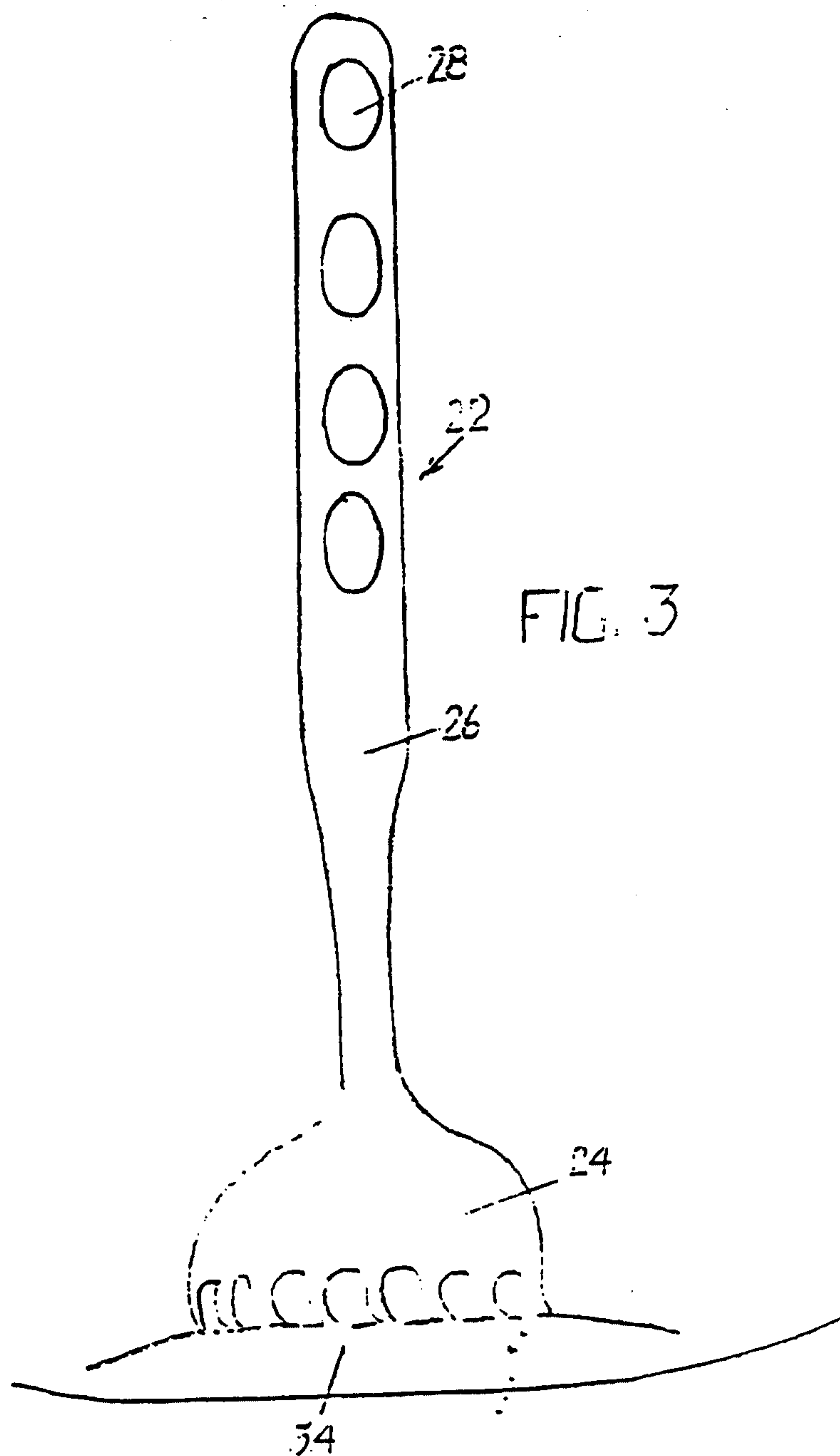


FIG. 2



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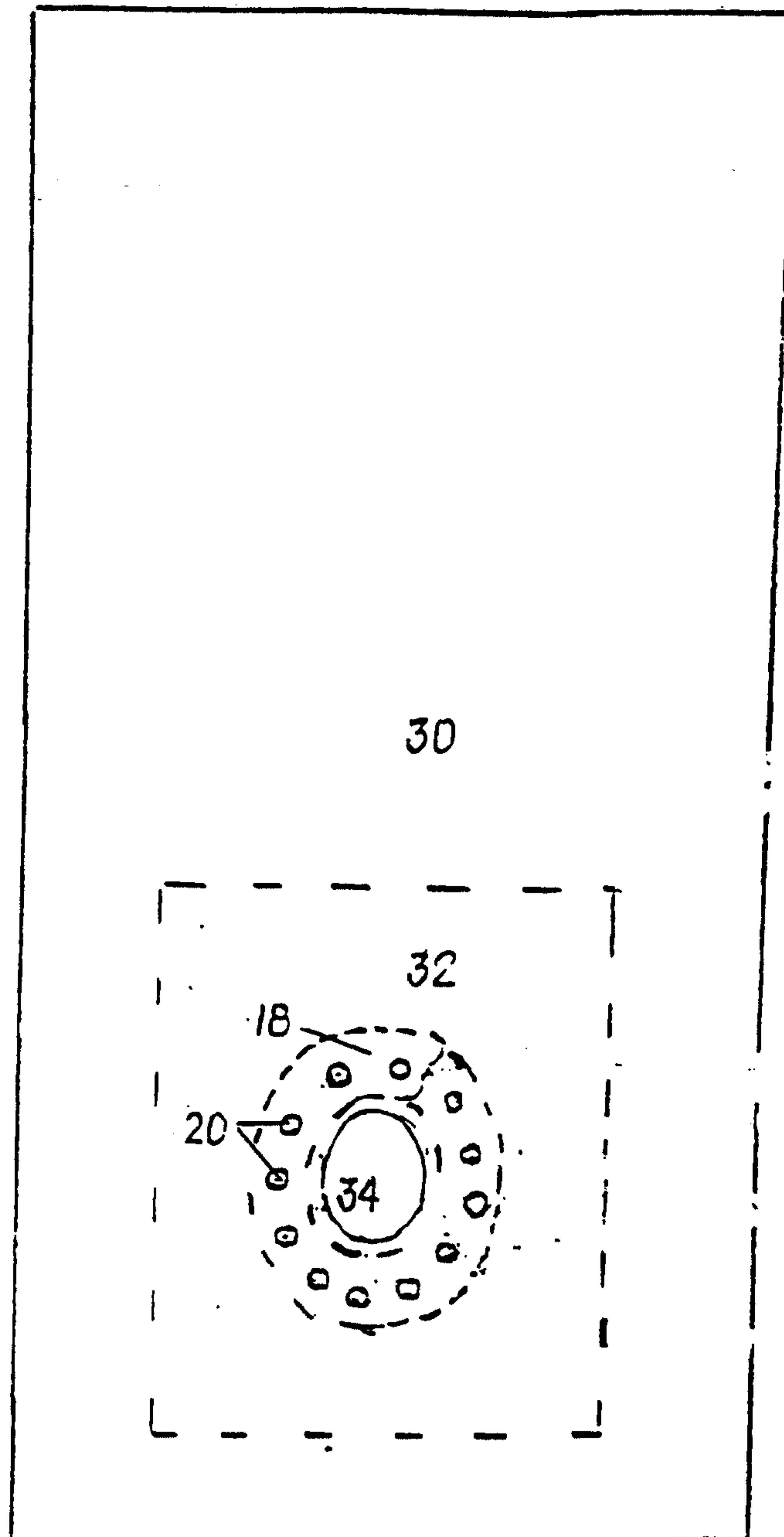


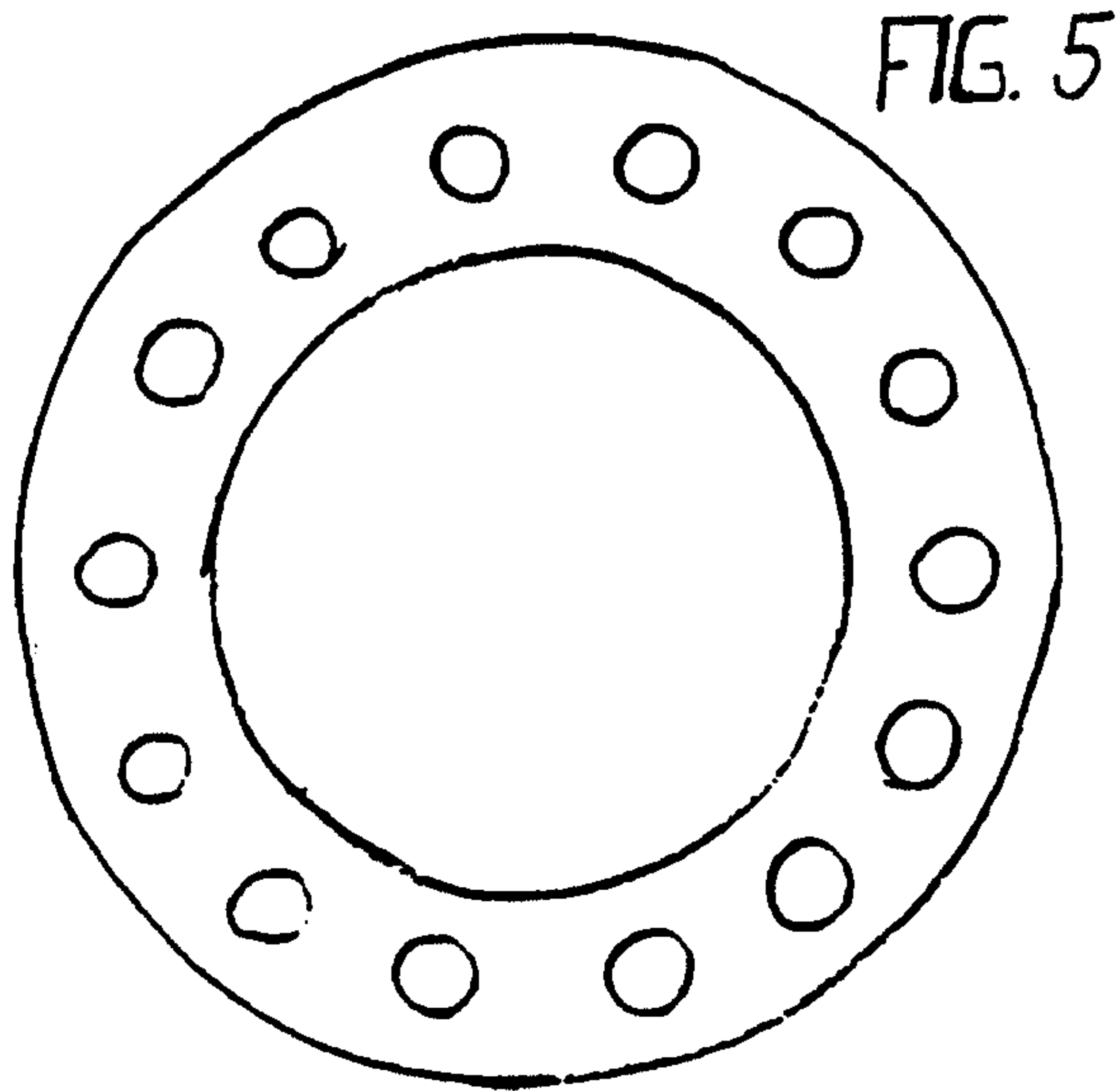
FIG 4



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FIG. 6B

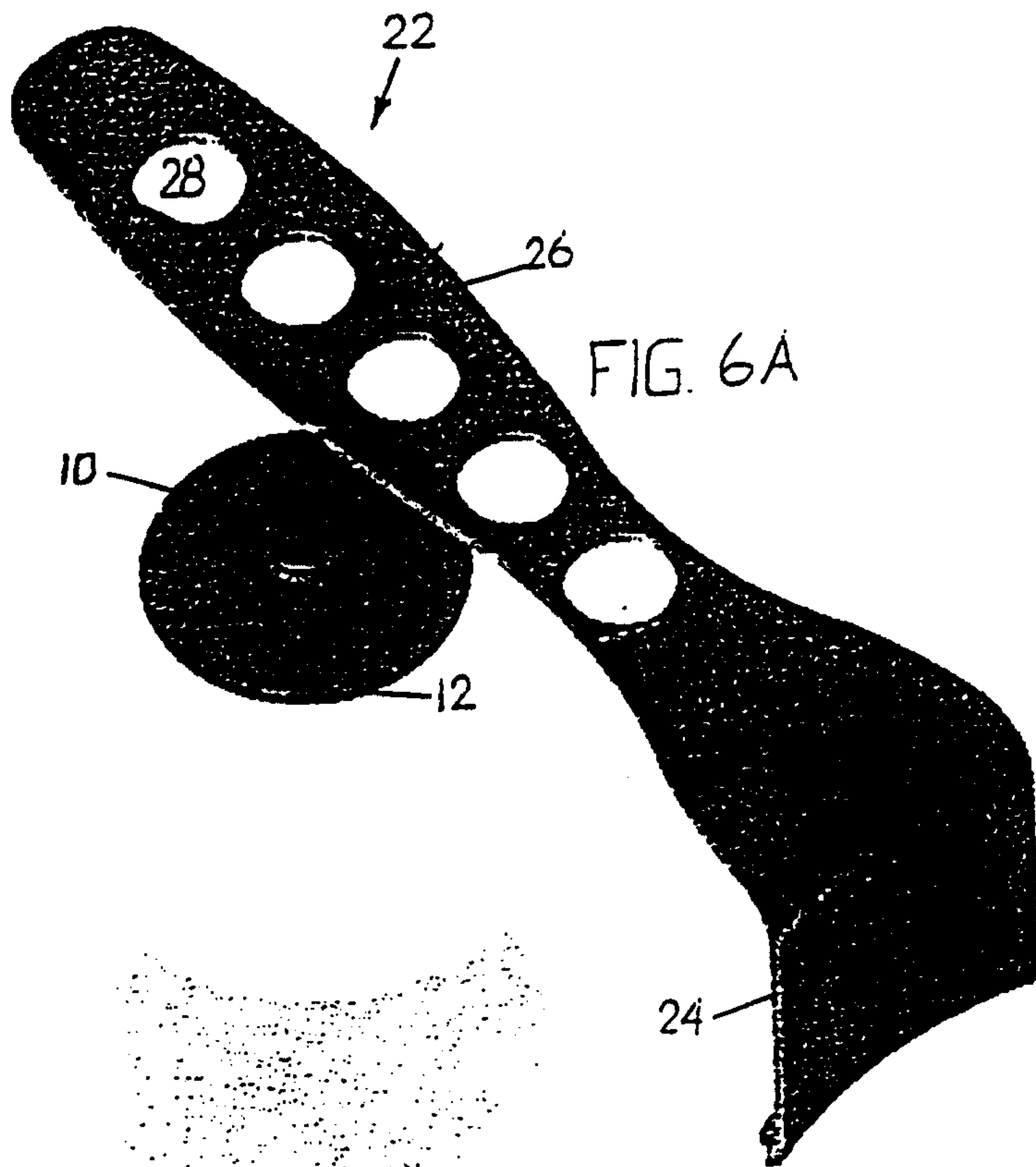
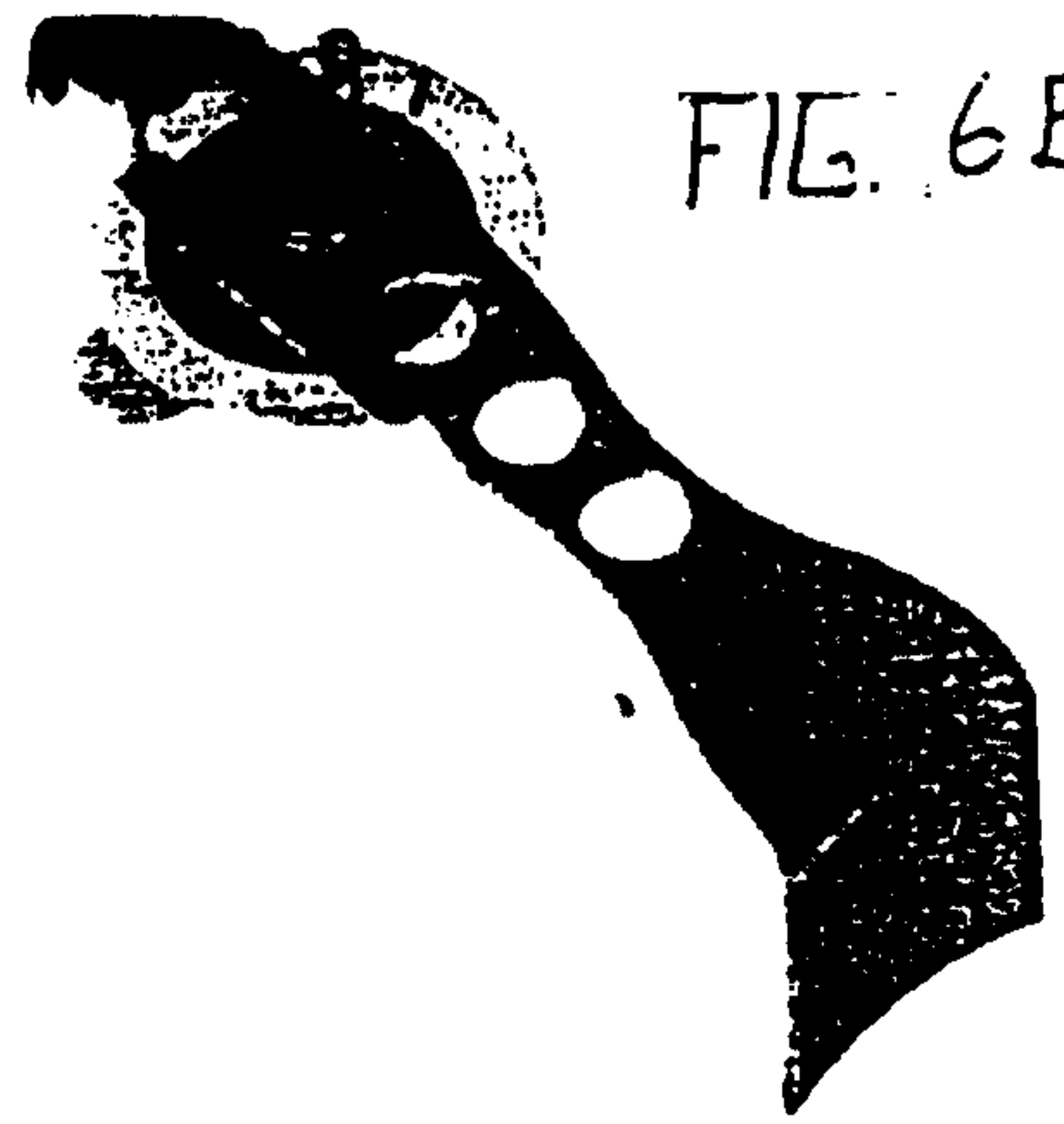


FIG. 6A

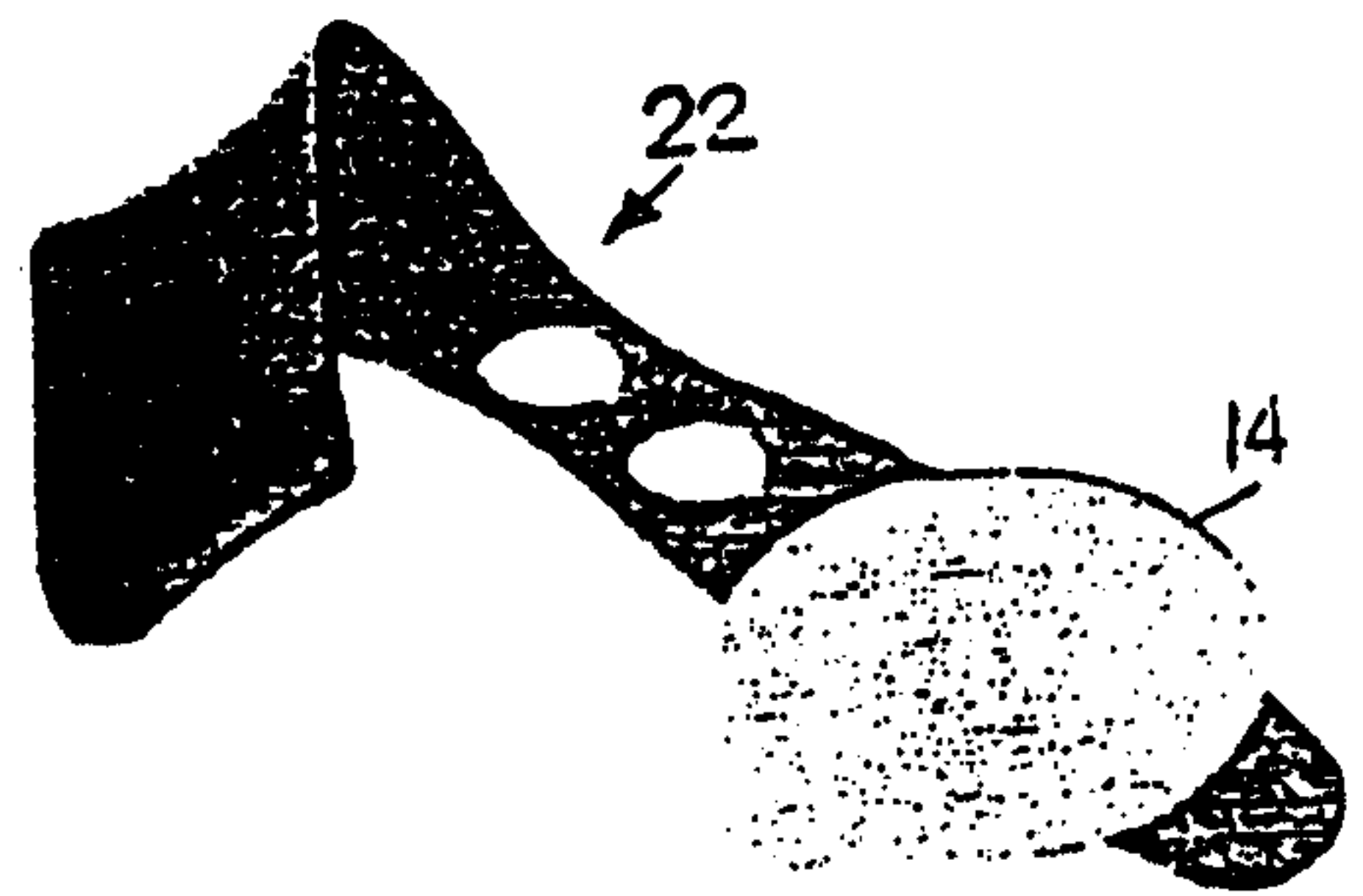


FIG. 6C



FIG. 6D

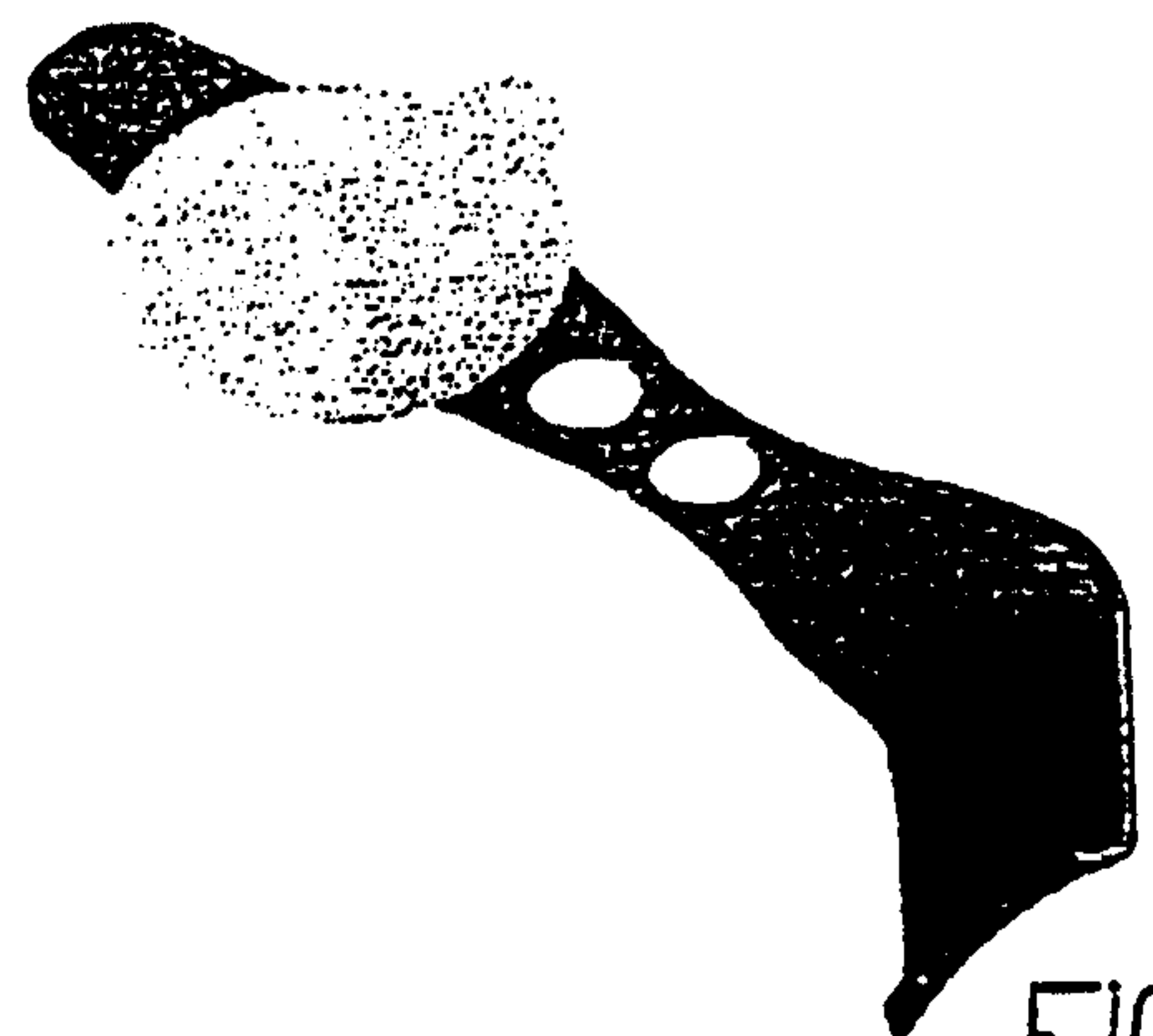
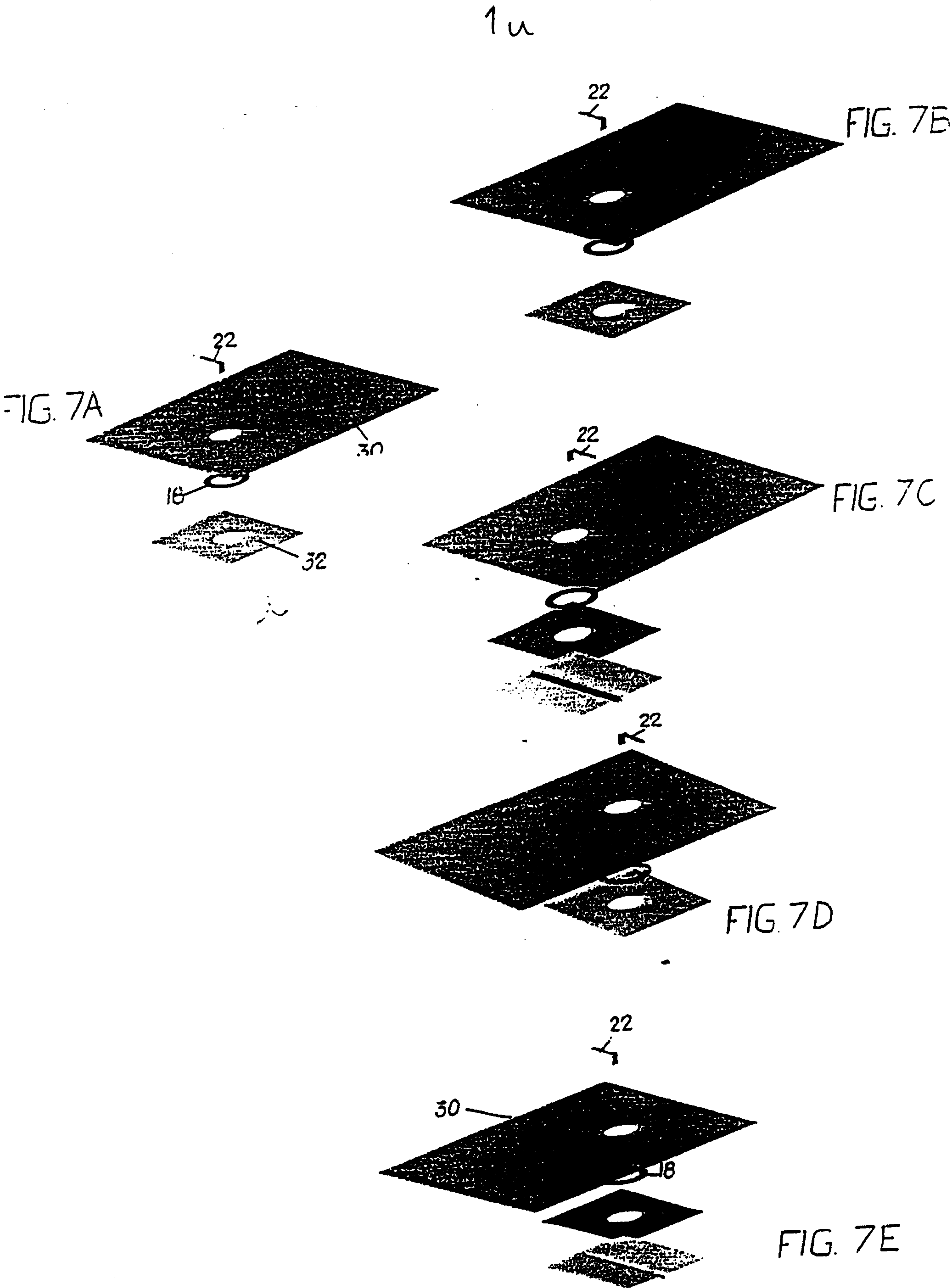
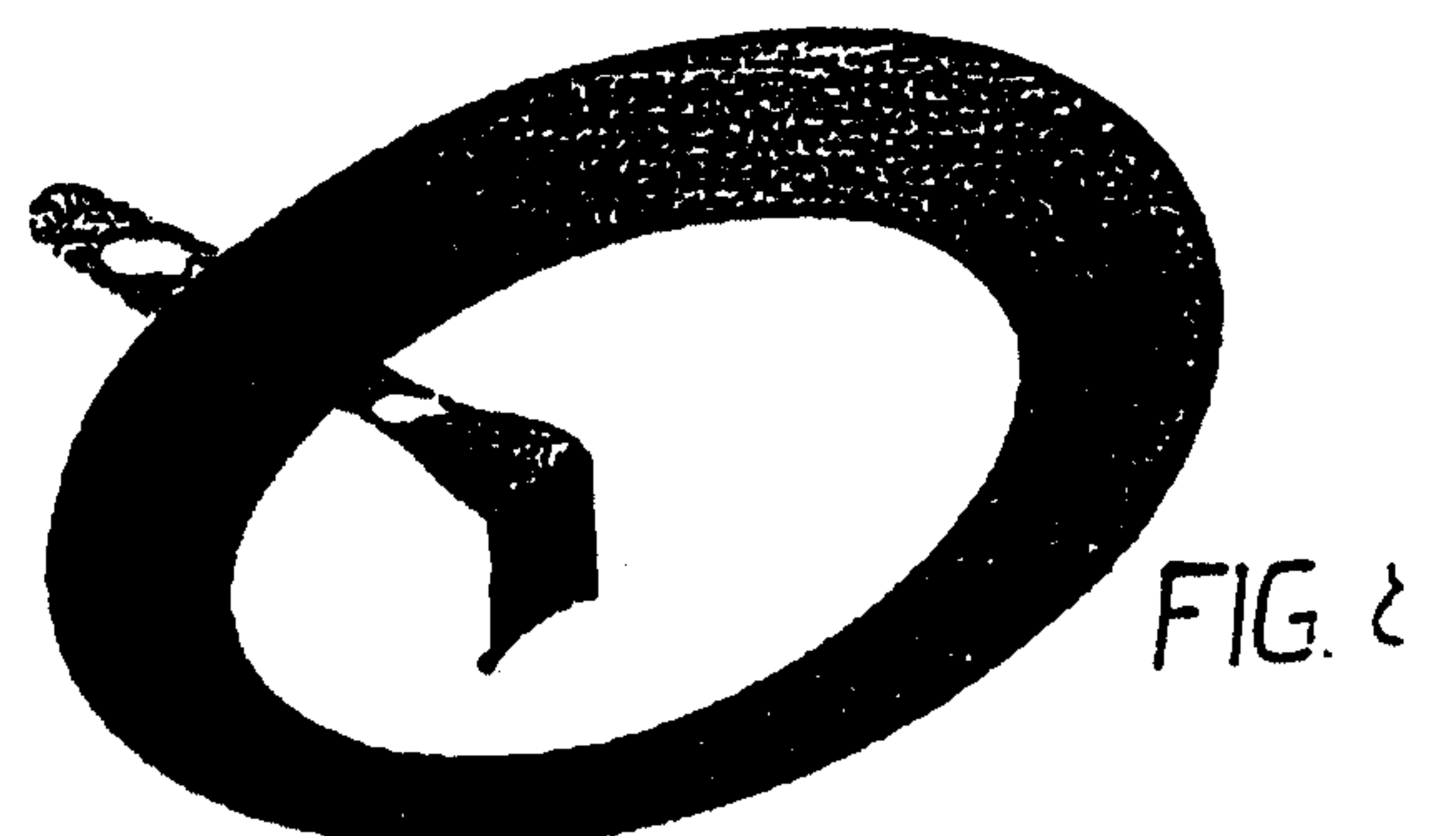
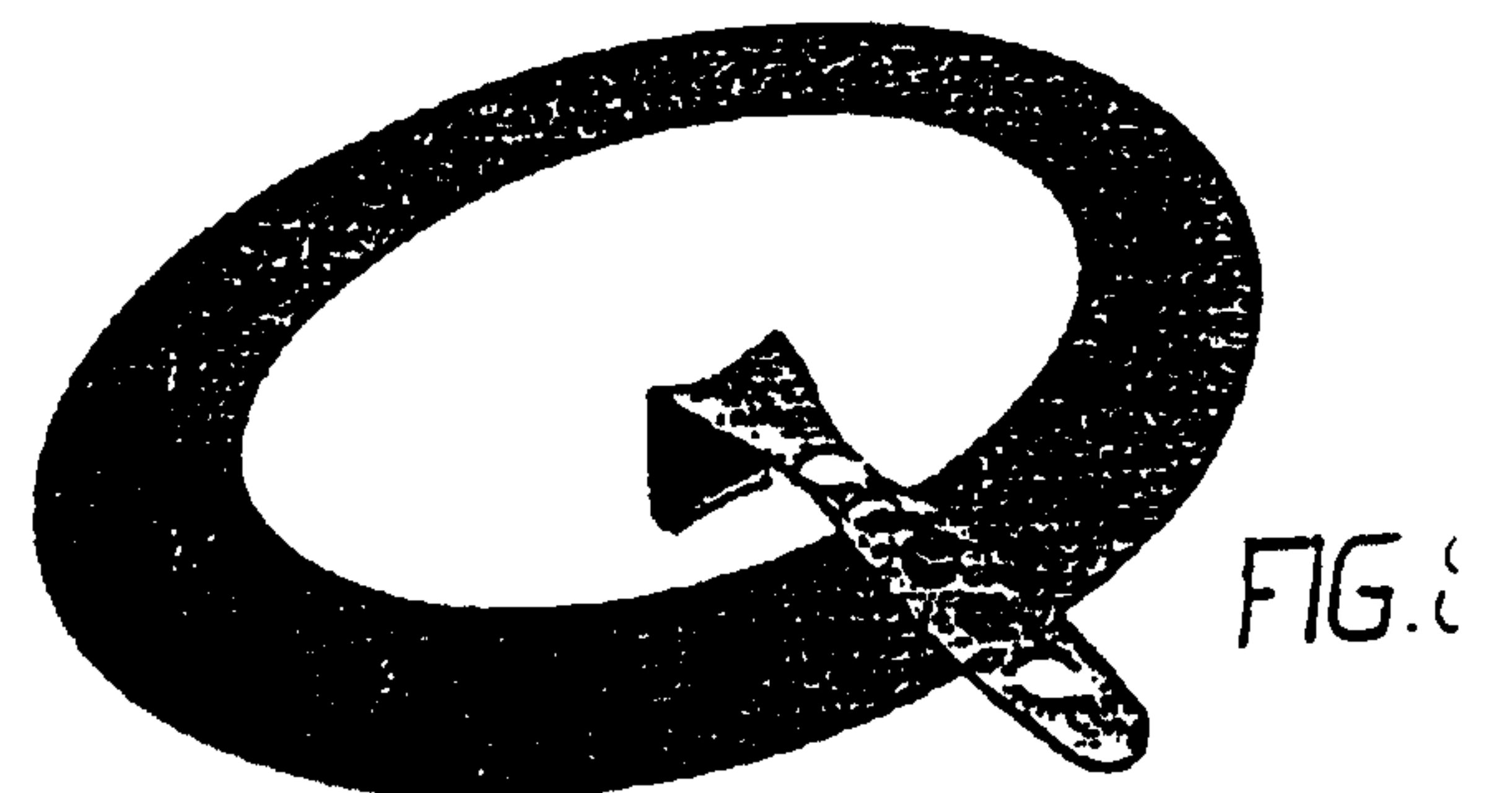
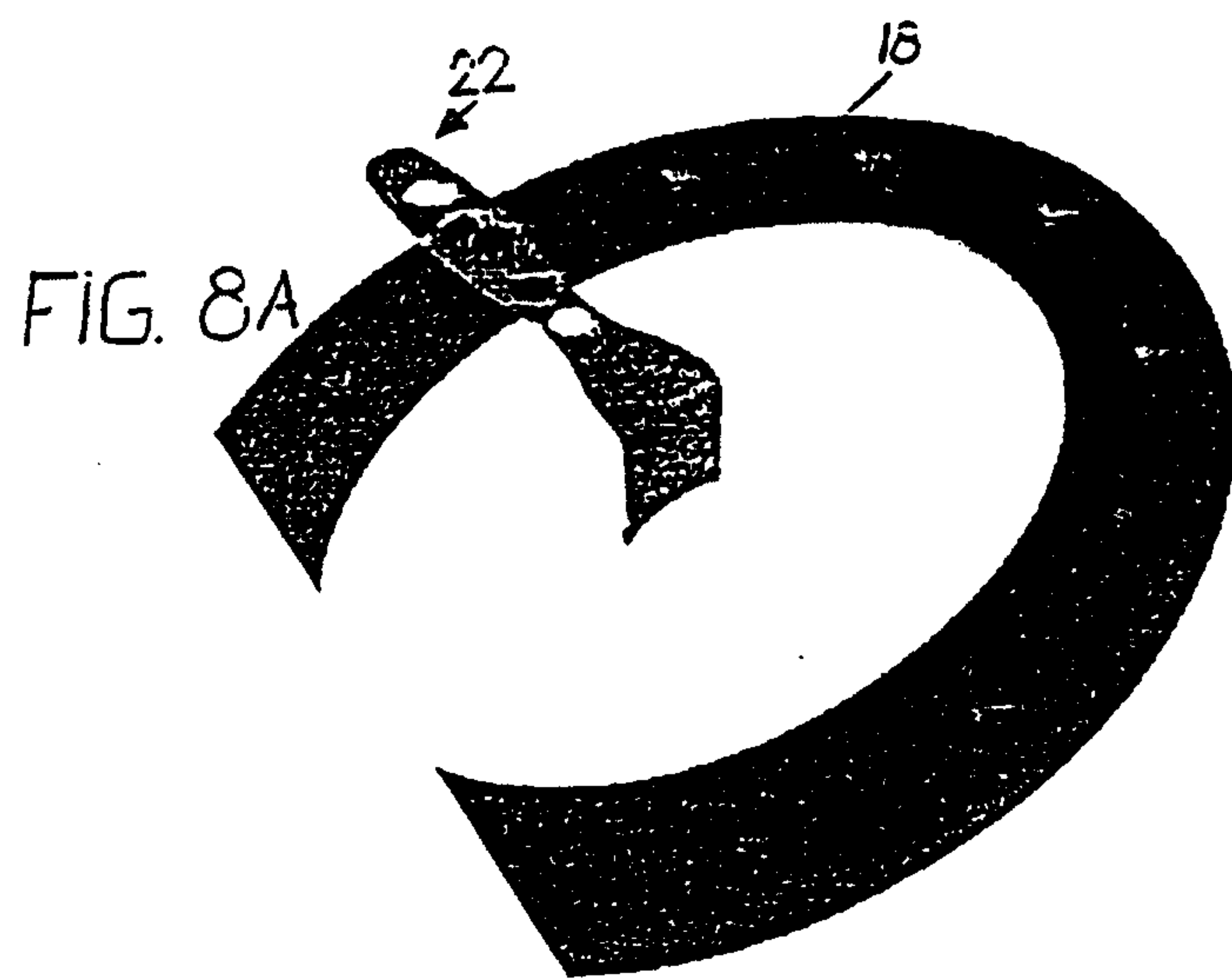
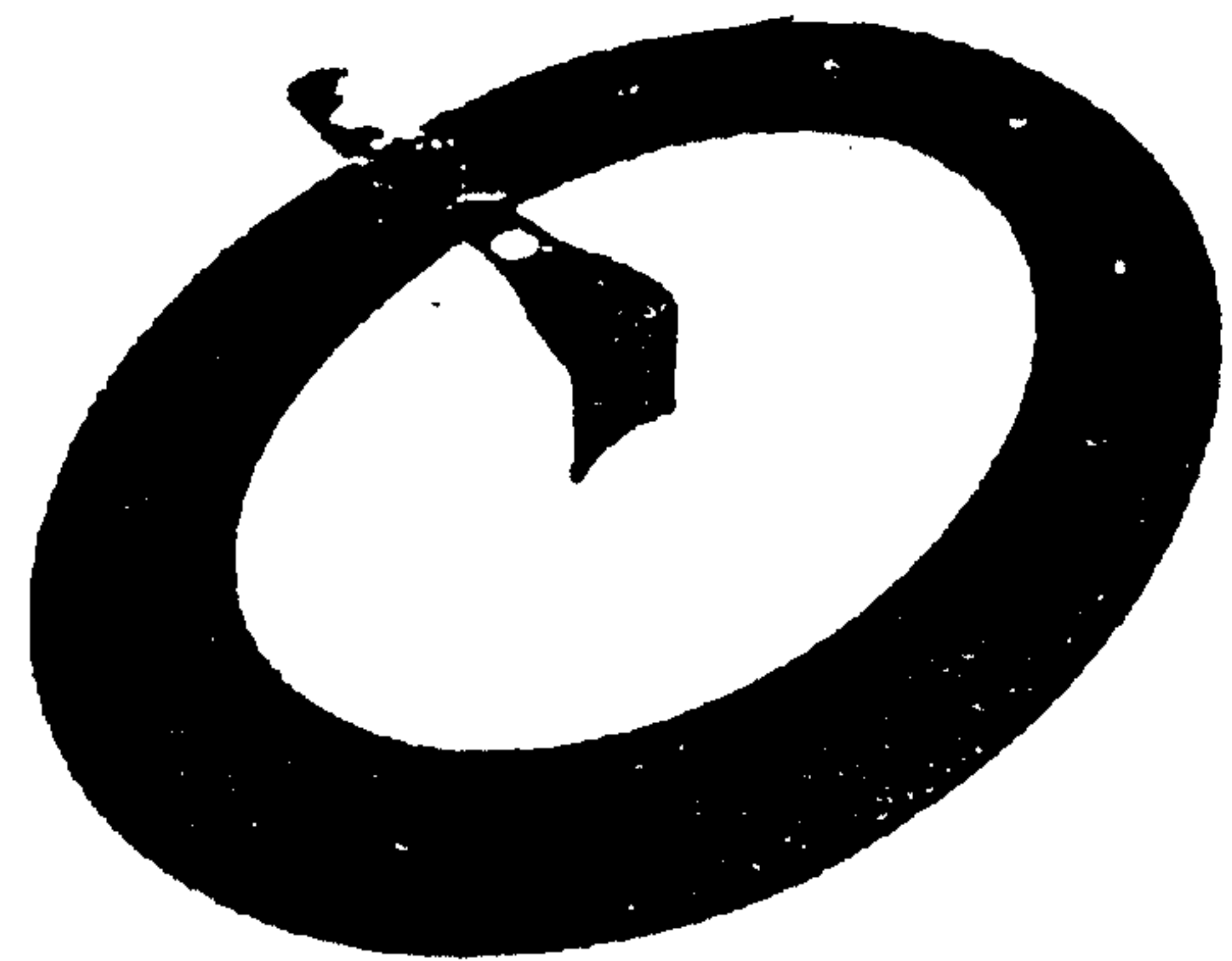


FIG. 6E





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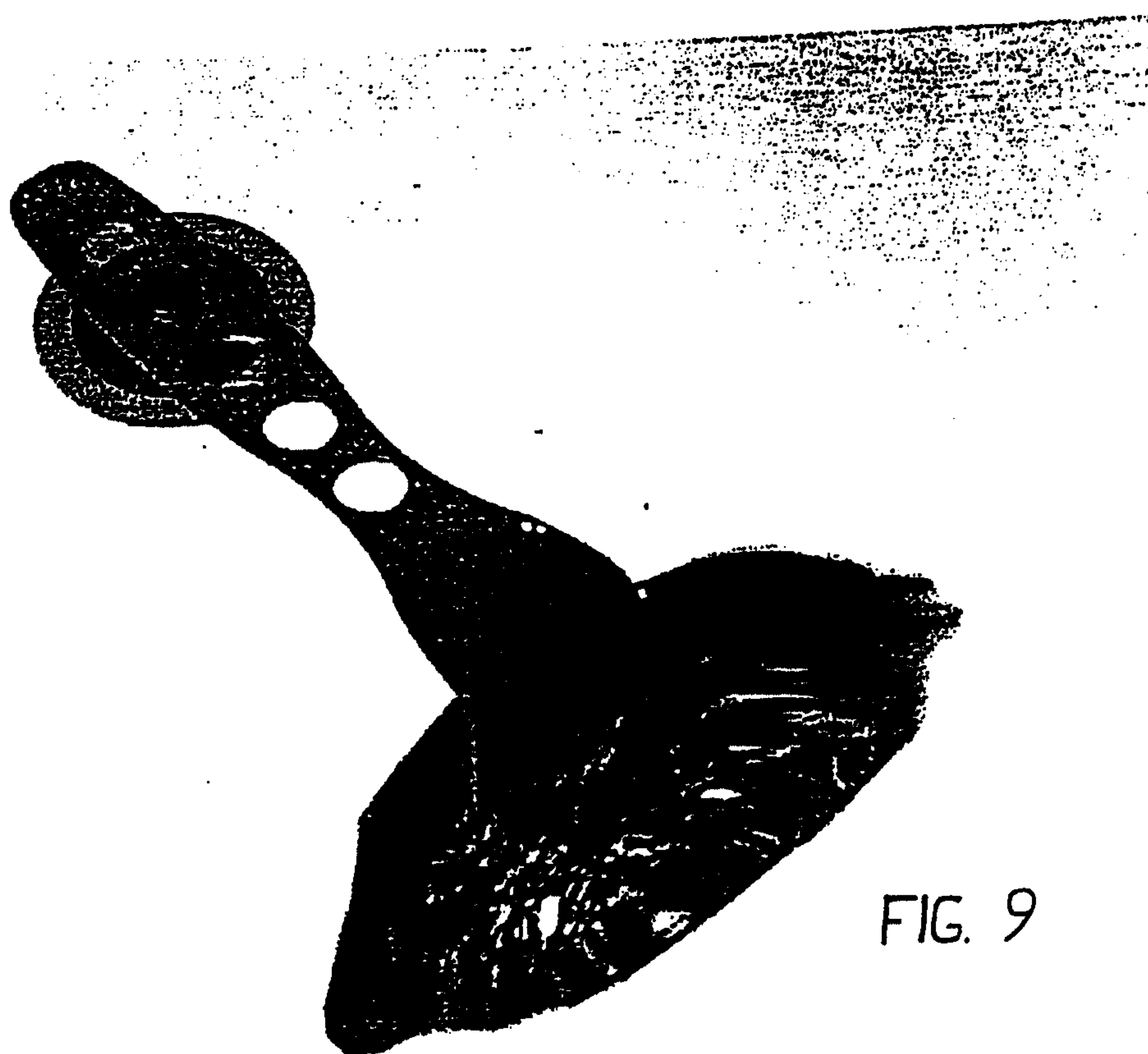


FIG. 9

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FIG. 10