

Oct. 7, 1969

H. R. GRIESHABER

3,470,872

PIVOTED RETRACTOR WITH SHIELDED SPACER TEETH

Filed Nov. 25, 1966

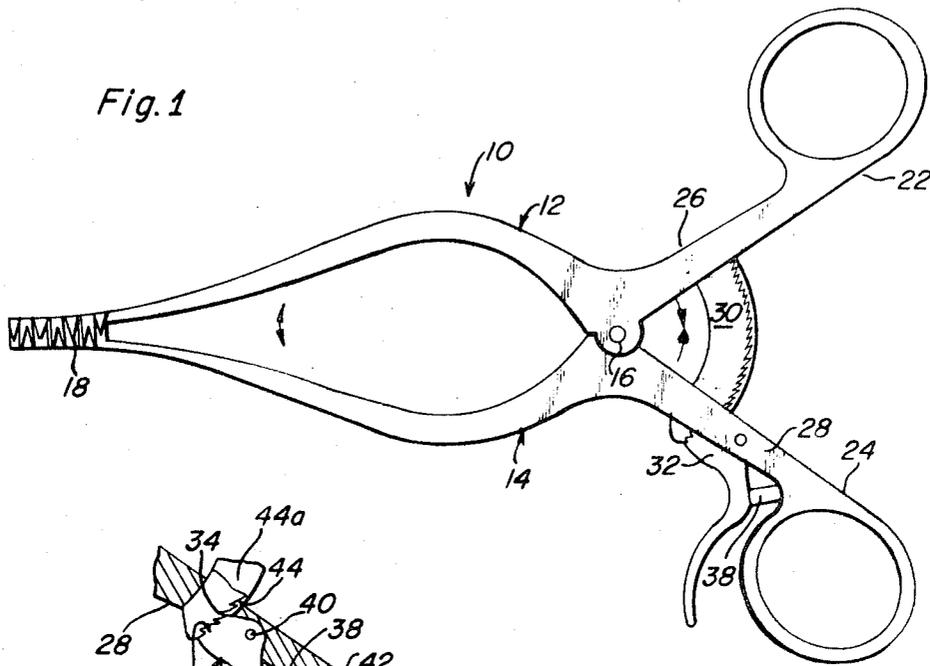


Fig. 1

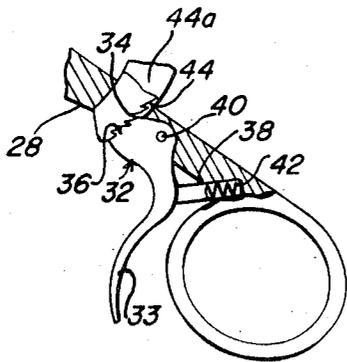


Fig. 2

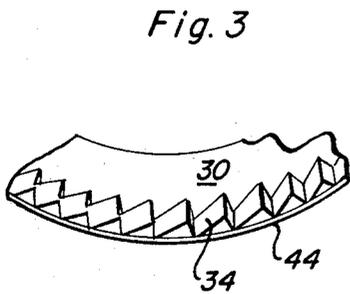


Fig. 3

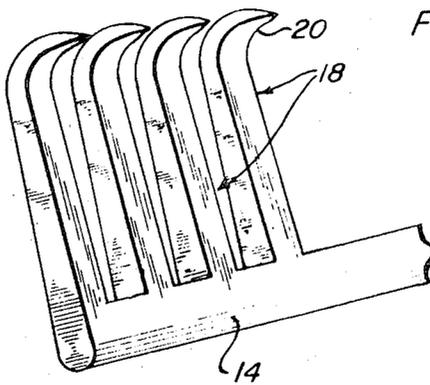


Fig. 4

INVENTOR.  
HERMAN R. GRIESHABER  
BY PENDLETON, NEUMAN  
SEIBOLD & WILLIAMS  
ATTORNEYS

1

2

3,470,872  
**PIVOTED RETRACTOR WITH SHIELDED  
 SPACER TEETH**

Herman R. Grieshaber, Kenilworth, Ill.  
 (7020 W. Cullom Ave., Norridge, Ill.)  
 Filed Nov. 25, 1966, Ser. No. 596,938  
 Int. Cl. A61b 17/50

U.S. Cl. 128—17

4 Claims

**ABSTRACT OF THE DISCLOSURE**

A surgical retractor employing pivotally connected arms having finger-engaging handle portions connected thereto utilizes a spacer strip mounted on one of the handle portions. The spacer strip has projections adapted to mesh with the teeth of a pivotal detent which is resiliently biased by means of an encased spring assembly. A shield disposed over the projections of the spacer strip prevents the retractor manipulator from coming into contact with the spacer projections.

This invention relates to a surgical retractor or like instrument, and more particularly pertains to an instrument containing a toothed spacer member extending between finger-engaging portions of the instrument in which a novel shield is provided to prevent contact of the user with the spacer teeth.

In tong-like instruments such as retractors wherein forces are exerted at the ends of the pivotally connected arms during use tending to collapse or close the same, means must be employed to maintain such arms in the desired open position. In a surgical retractor having opposed pivotal arms, tines or similar means are normally disposed at one terminal end of each arm for purposes of engaging and maintaining in spaced relationship tissue defining a surgical incision. Finger-engaging grip portions are disposed on the opposite ends of the arms of the retractor. One means commonly employed to maintain said arms spaced apart comprises an arcuate spacer plate extending from one pivotal arm to the other on which a pivotally mounted detent is mounted.

The teeth of the spacer strip directed in the direction of the instrument grip portions engage meshing teeth in the detent, which prevent closing of the retractor arms unless pivotally moved out of engagement with said spacer strip. However, because of the proximity of the teeth of the arcuate member to the retractor finger-engaging portion, tearing of gloves of the surgeon or his assistant oftentimes results. Such tearing not only confuses the operative procedures but also may on occasion provide a threat of infection.

In accordance with this invention the dangers inherent in the presence of such teeth are avoided by the placement of a novel shield over the teeth. Such shield prevents catching of adjacent materials while in no way interfering with the normal functioning of the retractor.

It is an object of this invention therefore to provide a surgical retractor or the like, in which teeth normally found in a spacer strip thereof provide no danger or problem whatsoever during normal instrument use.

It is another object of this invention to provide a surgical retractor or the like which may be simply modified so as to eliminate problems heretofore commonly encountered during use of such well known retractor construction.

In one embodiment of this invention a tong-like retractor is provided in which tines disposed at one distal

end of each of two pivotal arm portions are adapted to engage tissue such as define an incision for maintaining the same in spaced relation. Finger-engaging openings or grip portions disposed at the opposite ends of such arms enable the tines and engaged tissue to be spread apart by a surgeon or assistant by pivotally moving the tines apart. An arcuate spacer strip having a toothed edge disposed adjacent the grips coacts with a pivotal toothed detent for locking the arms in their spaced relationship. In accordance with this invention a novel shield for the teeth of the spacer strip is disposed thereover to obviate engagement with the surgeon's gloves or with other adjacent matter such as sponges, as will hereinafter be explained in greater detail.

For a more complete understanding of this invention reference will now be made to the drawing wherein:

FIG. 1 is a bottom plane view of one embodiment of a surgical retractor made in accordance with this invention;

FIG. 2 is a fragmentary elevational view partly broken away illustrating the manner in which the detent of a retractor of this invention is pivotally mounted to one of the instrument arms and the manner in which such detent is spring biased into engagement with a spacer strip fragmentarily illustrated;

FIG. 3 is an enlarged fragmentary perspective view of a toothed spacer strip employed in the retractor illustrated in FIG. 1; and

FIG. 4 is a fragmentary perspective view illustrated on a greatly enlarged scale of tines which may be employed on the terminal ends of each of the retractor arms for purposes of effecting a retracting function.

Referring now more particularly to FIG. 1, a retractor 10 is illustrated having opposed arm portions 12 and 14 which are pivotally connected by means of pin 16. Attached to a terminal end of each arm 12 and 14 are a plurality of tines 18 more clearly seen in FIG. 4. Each tine 18 has an outwardly disposed distal end 20 adapted to facilitate the spreading apart of engaged tissue. Each retractor arm 12 and 14 has integrally formed therewith at the end portion oppositely disposed to the tines 18 a finger-engaging grip portion. Grip 22 is formed with arm 12, and grip 24 is formed integrally with arm 14. The portions of the arms 12 and 14 extending from the pivot pin 16 to the grip portions 22 and 24 comprise handle portions 26 and 28 disposed to one side of pin 16 while the tines 18 are disposed on the opposite side.

In the normal course of retractor operation the tines 18 are disposed downwardly into an incision, and the engaged tissue spread apart by moving the handle portions and finger-engaging grip portions of a retractor together. It is apparent from the arrows shown in FIG. 1 that as the handle portions move together, the tines 18 of the handles to which attached are spread apart.

In order to position the tines and arms in a desired spaced relationship which shall remain fixed, arcuate spacer strip 30 is affixed to handle portion 26 of the retractor 10 by keying, pinning or the like. The strip 30 extends beyond the opposed handle portion 28 of the retractor as illustrated in FIG. 1.

Pivotally mounted on pin 40 of handle portion 28 of the retractor is a detent 32 more clearly seen in FIG. 2. The spacer strip 30 has projecting teeth disposed in the general direction of the underlying grip portions of the retractor, and more particularly, angled so as to point in the direction of the grip portion 22 of the device. These teeth 34 are adapted to mesh with mating teeth 36 which are angled in a direction opposite to that of teeth 34. Inasmuch as the detent 32 is pivotally mounted in off-

center condition, it is seen that as the handle portions and finger engaging grips are moved together, the teeth 34 of the spacer strip 30 will slidably move over the underlying teeth of the cam 32 which will be pivoted out of engagement with the teeth 34.

A spring loaded cylindrical pin 38 illustrated in FIGS. 1 and 2, and partially broken away in FIG. 2, urges the detent 32 and the teeth 36 thereof against the overlying spacer strip 30 and the teeth 34. When the handles 26 and 24 are pulled together, the teeth of detent 32 will be pushed from engagement with teeth 34 as the detent pivots about its pin 40 in opposition to spring 42 mounted in an opening in handle portion 28 of the retractor 10. However, should any force be exerted tending to push the opposed tines 18 of the arms 10 and 14 together, the teeth 36 of the detent 32 will function as a catch preventing movement of the handle portions 26 and 28 in an outward direction or movement of the tine portions 18 in an inward direction.

In order to collapse or bring together the tine portions 18 of the illustrated retractor, the detent 32 must be manually pivoted out of engagement with the teeth of the spacer strip 30 by means of handle portion 33 of the detent which may be easily pushed inwardly in opposition to the spring 42. After the restraining teeth 36 of the detent 32 are disengaged from the teeth 34 of the spacer strip 30 the tine portions may obviously be readily brought together and disengaged from the tissue with which they were initially engaged.

In utilizing instruments such as that above described, difficulty had previously been encountered in the course of instrument use as the result of the sharp teeth 34 of the spacer strip engaging and tearing the thin rubber gloves of the surgeon or his assistant manipulating the same. In addition such sharp teeth could readily engage a sponge or other material which might be brought into contact therewith.

In accordance with this invention, an arcuate plate or shield 44 is mounted on the upper surface of the spacer strip 30 in such manner so as to project beyond the terminal ends of teeth 34 in the manner illustrated in FIG. 3. As a result of such plate it is virtually impossible for a surgeon to contact such teeth in the normal course of instrument use inasmuch as the surgeon's glove will first engage the plate 44.

The plate 44 is securely adhered to the spacer strip 30 so as to insure a full surface-to-surface contact with no open spaces between the plate and strip which would function as a breeding or harboring place for germs or bacteria. Shield plates may be employed on opposed surfaces of the spacer strip as indicated in FIG. 2 wherein shield plate 44a is oppositely disposed to shield 44. Plate 44a is of course adhered to the strip 30 similarly to plate 44. It is apparent that the most common difficulty previously encountered was the tearing of the surgeon's gloves when the surgeon's forefinger was employed to engage the detent handle portion 33 thereby releasing the detent from engagement with the spacer strip. In the course of such release operation, the glove portion of the finger tripping the detent 32 oftentimes came into engagement with the sharp teeth 34 in the spacer strip and in many instances the glove was torn.

The specific configuration of the elements disposed on the ends of the arms 12 and 14 is of no importance to this invention. This invention is concerned solely with the protection to be afforded the user, and more specifically the protection against tearing action of the teeth 34. In addition, a subsidiary feature of this invention comprises the spring loaded pin 38 which also is free from all projections or cutting surfaces and by virtue of the snug, slidable relationship with the opening in the handle portion 28 of the retractor 10, minimizes the danger of foreign matter accumulation on pin 38. In addition pin 38 is free from all surface configurations or points which may engage a surgeon's glove, sponge or the like.

It is seen therefore that a simple protective structural feature has been provided which is adapted for use with retractors and other similar surgical and dental instruments such as dilators with a minimum amount of modification of the basic instrument. The presence of the protective plate or plates, while affording maximum protection in no way detracts from the ability of the instrument to be sterilized in the course of being rendered germ free. Also, a novel spring loaded pin has been provided for purposes of urging the provided detent into engagement with the teeth of the spacer blade.

Without further elaboration, the foregoing will so fully explain the character of our invention that others may, by applying current knowledge, readily adapt the same for use under varying conditions of service, while retaining certain features which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to us by the following claims.

I claim:

1. In a surgical retractor the combination comprising pivotally connected arms movable about a pivot point, said arms having connected thereto handle portions with finger-engaging openings adapted to be moved into adjacent and spaced relationships, said arms and handle portions being arranged relative to said pivot point whereby the distal ends of said arms are in abutting relation when said handle portions are in maximum spaced relation, said arm distal ends being adapted to move apart as said handle portions approach each other; spacer means mounted on one of said handle portions and extending toward the other of said handle portions and having a plurality of projections extending from an edge portion of said spacer means disposed adjacent said finger-engaging openings; shield means disposed over all of said projections preventing contact between said projections and the fingers of the manipulator of said retractor when said projections are approached in a plane normal to that in which said spacer means is disposed; a resiliently biased, toothed detent mounted on said other of said handle portions and adapted to pivot into engagement with the projections of said spacer means for preventing movement of said arms toward each other when the teeth thereof engage the projections of said spacer means.

2. The device of claim 1 in which said toothed detent is spring loaded into engagement with said spacer means, the spring being mounted in a reciprocally movably cylindrical container extending from said other of said handle portions and urging said detent into engagement with said spacer means.

3. The surgical retractor of claim 1 in combination with a discrete plate means disposed on at least one surface of said spacer means and extending beyond said projections.

4. In a surgical retractor, the combination comprising opposed pivotally connected arms pivotal about a pivot point into spaced and adjacent relationship; each of said arms being connected to a finger-engaging handle portion adapted to be manually engaged for moving said arms into desired relationship; spacer means extending between said handle portions attached to one of said handle portions and having projections disposed along an edge adjacent said finger-engaging handle portions; a pivotal detent mounted on the other of said handle portions and having teeth biased into engagement with the projections of said spacer means, the relative angularity of said spacer means projections and said detent teeth enabling relative slidable movement therebetween when said opposed arms are pivotally moved apart and providing for meshing engagement when said arms are pivotally moved toward each other; said detent engaging a spring-loaded projection snugly and reciprocally mounted in a receiving opening disposed in the other of said handle portions; said detent having a handle portion whereby the teeth

thereof may be readily pivoted out of engagement with the projections of said spacer means in opposition to said spring-loaded projection.

References Cited

UNITED STATES PATENTS

1,123,243	1/1915	Champ	81—393
1,616,621	2/1927	Hooks	29—223
1,852,542	4/1932	Sovatkin	128—325
2,250,400	7/1941	Stephens	81—328

2,293,984	8/1942	Kirschbaum	128—323
2,481,007	9/1949	Dugdale	128—17 XR
3,038,467	6/1962	Sovatkin	128—17
3,176,682	4/1965	Wexler	128—17

5 RICHARD A. GAUDET, Primary Examiner

KYLE L. HOWELL, Assistant Examiner

U.S. Cl. X.R.

10 29—239; 81—328; 128—321