

[54] **SAFETY GUARD FOR DERMATOME INSTRUMENT**

[76] Inventor: **Burton David Brent**, 1110 Cleveland St., Evanston, Ill. 60202

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[58] Field of Search 30/123 A, 123 B, 30/136, 286, 295; 128/305, 305.5

[56] **References Cited**

UNITED STATES PATENTS

2,400,336 5/1946 Bishop 128/305

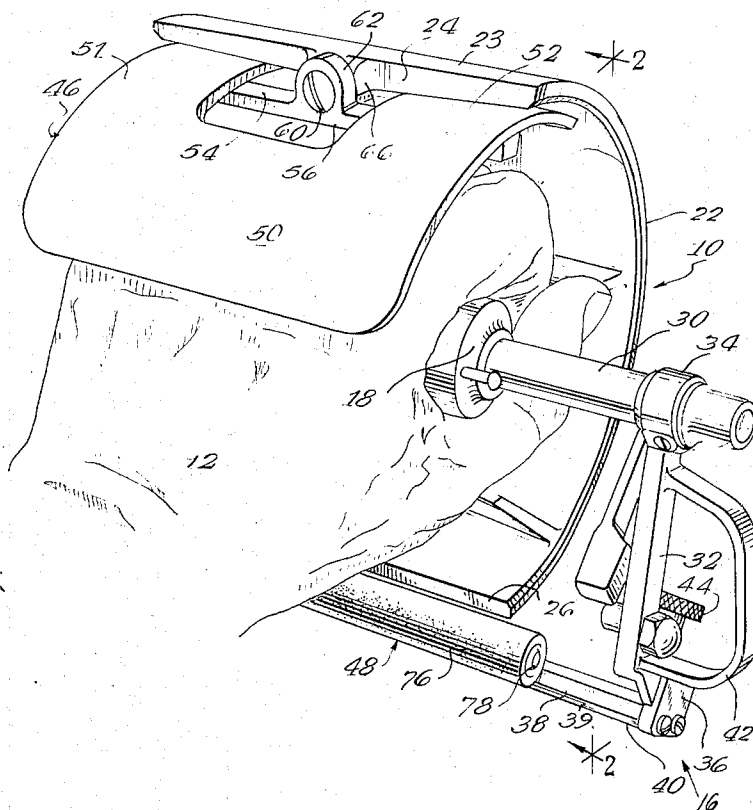
2,435,278 2/1948 Hood 128/305
2,579,029 12/1951 Barker et al. 128/305

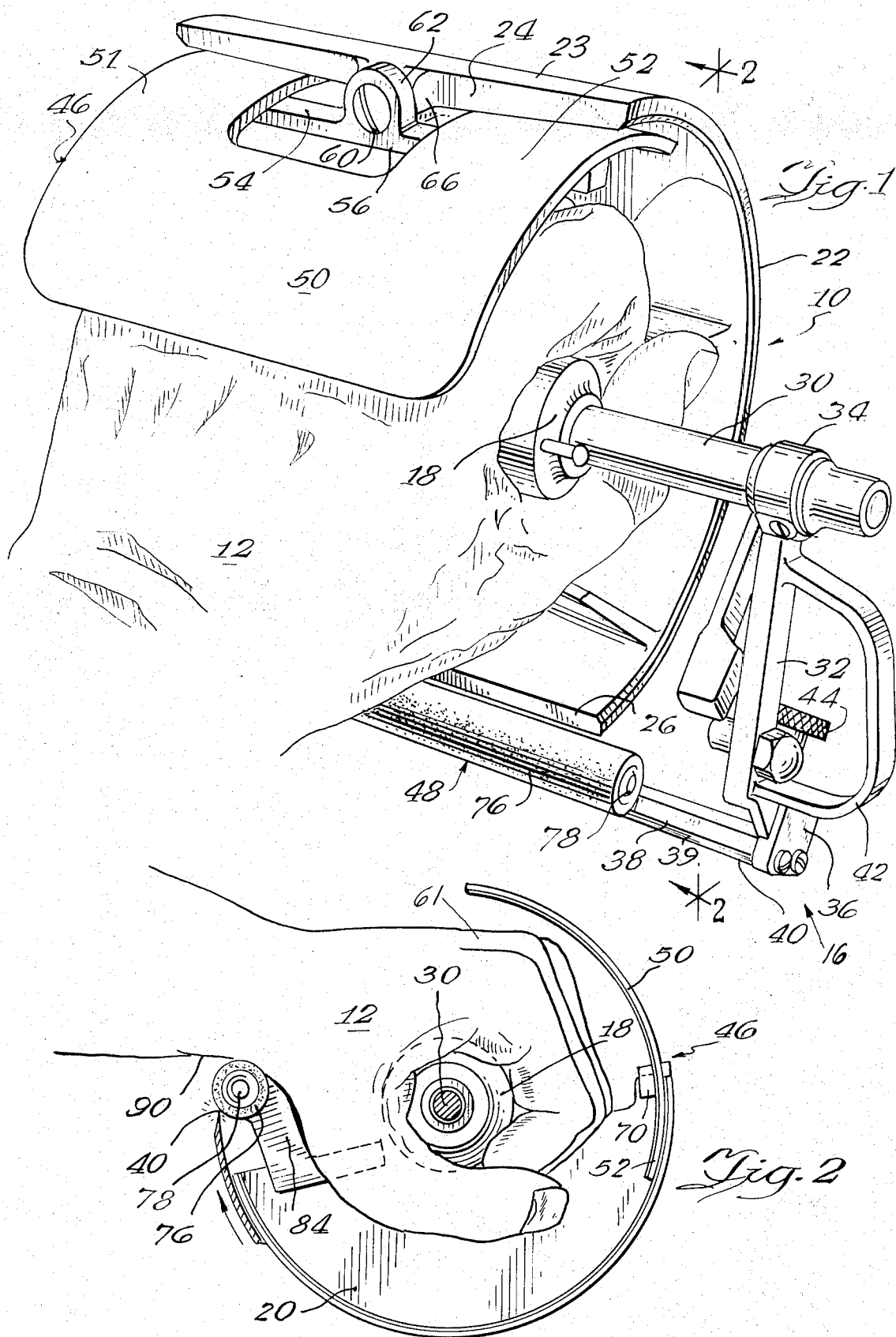
Primary Examiner—Channing L. Pace
Attorney—I. Irving Silverman et al.

[57] **ABSTRACT**

A surgical instrument for skin grafting or a dermatome having a safety guard means on the shoe or drum thereof located to protect a surgeon's hand from the cutting blade during use of the instrument. The safety guard means is operative to protect the operator's exposed wrist tendons or tendons and skin across the knuckles and dorsum of the hand grasping the grip or handle of the instrument.

7 Claims, 4 Drawing Figures





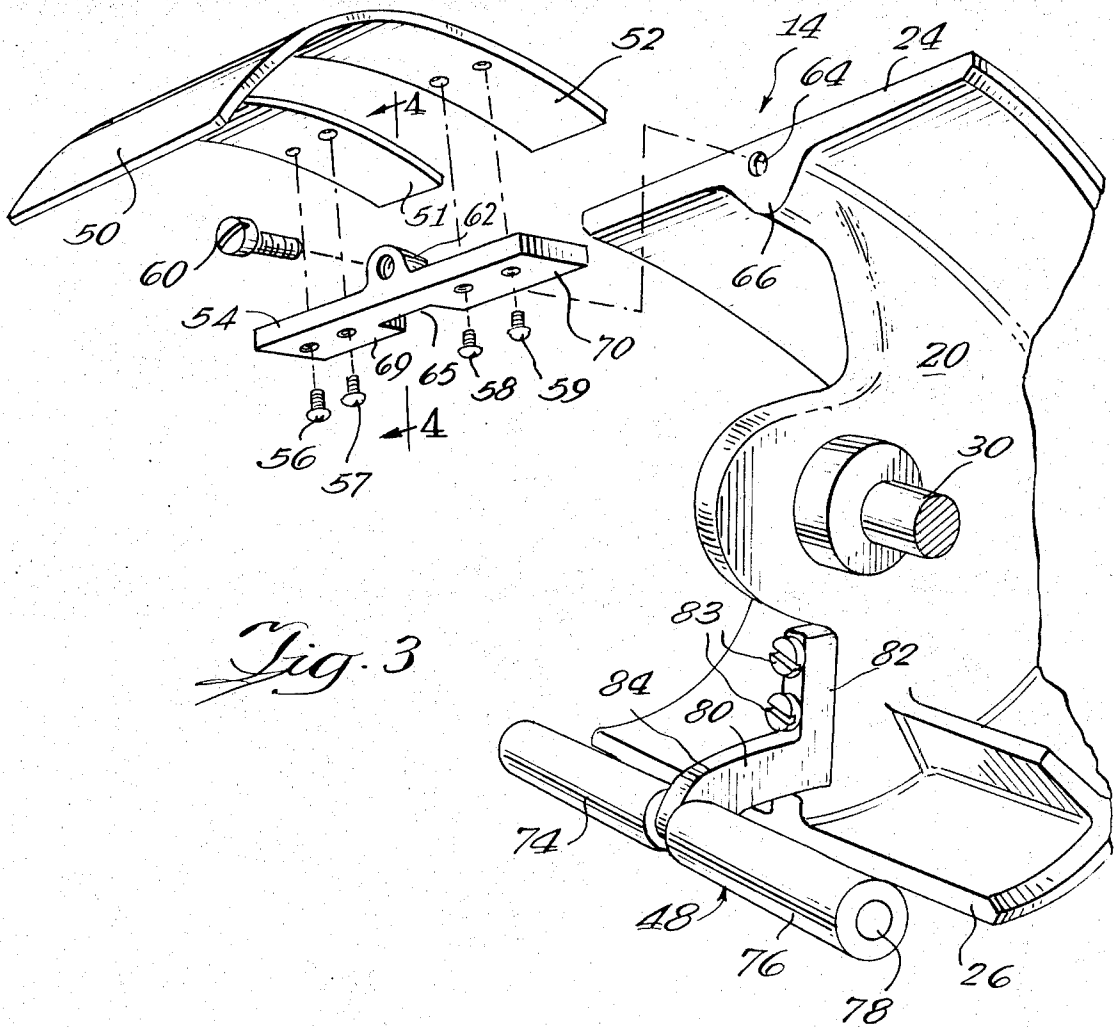


Fig. 3

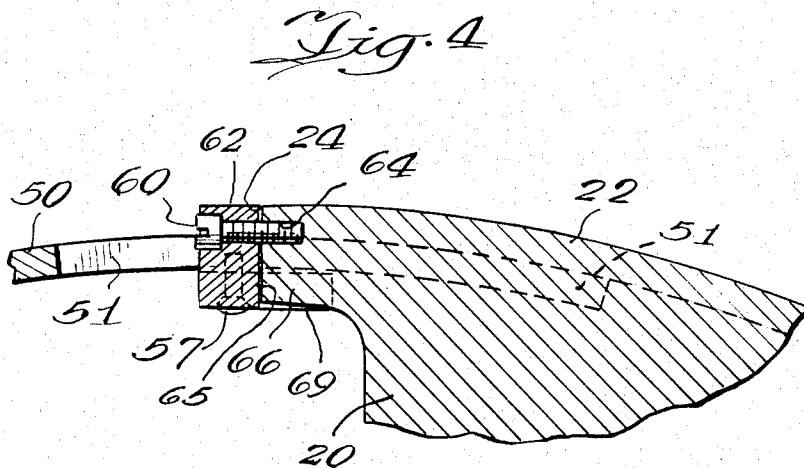


Fig. 4

SAFETY GUARD FOR DERMATOME INSTRUMENT

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to surgical instruments for skin grafting or a dermatome as disclosed in U.S. Pat. Nos. 2,435,278 and 2,288,709 and more specifically, relates to novel safety guard means for protecting the surgeon's hand holding the dermatome.

The dermatome concerned herewith has a grip, handle or hub held by one hand of the surgeon and a drum mounted on a web extending outwardly from the hub. A blade mounting assembly is rotatably attached to the hub and includes a bar mounting a cutting blade. The cutting blade is mounted to swing in an arcuate path adjacent the outer surface of the drum and a mechanism is provided for selectively adjusting the distance of the cutting edge of the blade relative to the drum surface.

In using the dermatome, a cement is applied to the patient's donor skin area and to the outer surface of the drum. Then the drum is engaged with the skin and lifted to elevate the skin. The drum is rolled over the skin surface in advance of the cutting blade manipulated by the surgeon's second hand. As the cutting proceeds, the donor's skin area separated by the cutting blade adheres to the outer surface of the drum in a protected condition ready for use. Subsequently, the skin is removed from the drum surface and grafted to the recipient area of the patient.

The drum or shoe extends through an arc of approximately 180° around the surgeon's hand grasping the grip or handle of the dermatome during its use. Typically, the instrument is held in such a manner that the cutting blade can be reciprocated from a position passing over the knuckles of the hand toward one end edge of the drum to a second position toward the opposite edge of the drum toward the tendons of the wrist. Since the cutting blade can rotate freely clockwise and counter-clockwise, these two areas of the surgeon's hand holding the tool can be severely injured by inadvertent or uncontrolled movement of the cutting blade. Previous experiences with this dermatome clearly establish the high probability of severe injury to portions of the surgeon's hand holding the dermatome which are exposed to the cutting blade beyond the opposing free edges of the drum or arcuate shoe.

Another occasion for injury is at completion of cutting of a skin graft. Here, the surgeon's wrist is exposed beyond a free end of the drum and in the path of the cutting blade. If the surgeon does not exercise due caution when rotating the blade with his other hand, he may roll the drum excessively so as to bring the blade into engagement with his wrist sufficiently to sever a tendon or blood vessel, or nerve.

Also, upon completion of graft cutting, the surgeon frequently has to change grip by rotating his hand 180°, thus having the blade facing in the opposite direction in relation to the surgeon's hand. Thus, when carrying the dermatome with adhering cut skin graft away from the donor site, the blade is free to swing and strike the dorsum of the wrist. This is a frequent occurrence of injury.

According to the invention, there is provided safety guard means for a dermatome or surgical instrument for skin grafting of the type disclosed in said U.S. Pats.

Nos. 2,288,709 and 2,435,278, said means being supported on the drum or shoe of the dermatome in position protecting the surgeon's hand holding the instrument from being cut by inadvertent or uncontrolled movement of the cutting blade during use of the instrument.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a dermatome or surgical instrument for skin grafting shown in use with the surgeon's hand gripping the instrument and the safety guard means embodying the invention mounted thereon.

FIG. 2 is a sectional view taken through the dermatome along the line 2—2 of FIG. 1 and in the direction indicated generally.

FIG. 3 is a fragmentary exploded perspective view of the dermatome showing details of the safety guard devices.

FIG. 4 is a fragmentary, sectional view taken along the line 4—4 of FIG. 3 and in the direction indicated generally.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

A dermatome or surgical instrument for skin grafting with which this invention is especially suitable is designated generally by reference character 10 in FIG. 1. For purposes of this invention, the dermatome is constructed and functions in the general manner described in said U.S. Pats. Nos. 2,288,709 and 2,435,278 and is especially adapted for those dermatomes. As seen in FIG. 1, the surgeon's hand 10 holds the dermatome 10 for rolling movement over the skin area to be severed or separated from the donor site.

Dermatome 10 includes a drum assembly 14 and a cutting blade mounting assembly 16. The assembly 14 includes a central hub 18 and a web 20, as seen in FIG. 3, connected between hub 18 and the arcuate or drum shoe 22. The shoe or drum 22 has an outer surface 23 which extends between the opposing free edges 24 and 26 of the drum 22, which is in the form of a metal casting.

The hub 18 has a shaft 30 mounted therein which extends outwardly from each end face of the hub 18. The blade mounting assembly 16 is rotatably mounted on the shaft 30. The blade mounting assembly 16 includes two spaced-apart legs 32 which are mounted on each end of the shaft 30. Only one of the legs 32 is shown in FIG. 1. As shown, one end 34 of the leg 32 is rotatably journaled to the shaft 30. The other end 36 of the leg 32 extends radially outwardly from the shaft 30 to a point beyond the circumferential surface 23. A blade mounting bar 38 is mounted between the ends 36 of the legs 32 and supports a cutting blade 39 having a knife edge 40. Each leg 32 has a handle 42 and a mechanism including two thumb screws 44, for selectively adjusting the position of the cutting edge 40 relative to the surface 23 in the same manner as taught by Hood in U.S. Pat. No. 2,435,278. As described, the dermatome 10 is intended to be conventional and is available from Padgett Dermatome Division of Kansas City Assemblage Co., Inc. of Kansas City, Mo.

The safety guard means embodying the invention are designated generally by the reference characters 46 and 48 in FIG. 1. The means 46 can be considered to be an extensor tendon guard. Same includes a curved

or arcuate metal plate 50 preferably of aluminum. Plate 50 is generally U-shape in plan configuration so that two legs 51 and 52 can be inserted beneath the drum 22 straddling the web 20. An elongate, generally rectangular mounting bracket 54 and fasteners 56-59, such as screws, are provided for securing the legs 51 and 52 to the bracket 54. A mounting bolt 60 is provided to pass through a bore enlarged portion 62 of the bracket 54 for attaching the device 46 to the free edge 24 of the drum 22. Opening 64 is located approximately midway between the side edges of the drum 22 and in the area where the web 20 is connected to the drum. When so mounted, the device 46 protrudes beyond edge 24 to extend over the knuckle and upper lateral surfaces 61 of the surgeon's hand 12. The guard plate 50 is always located between the path of movement of blade 39 and the upper surfaces 61 of the hand 12 to function as shield to prevent inadvertent and undesired contact of cutting edge 40 with hand 12.

It will be noted that the mounting bracket 54 has a U-shaped notch 65 which straddles the abutment 66 of the web 20. In this way portions 69, 70 of the bracket 54 and legs 54 of the plate 50 extend underneath the drum 22 from free edge 24, as best shown in FIG. 4. Also, it will be noted that a conventional dermatome can be modified readily and economically to include the safety device 46 merely by drilling and tapping hole 64 in the drum casting 14.

For newly made dermatomes, the drum 22 can be formed with an extension corresponding to plate 50 as an integral part thereof. Also other means for securing such a shielding plate 50 can be utilized within the skill of the art. These additional expedients for achieving the same safety guard results are deemed sufficiently clear, as explained, so as not to require additional disclosure for the sake of clarity of this specification.

The safety means 48, which may be considered a flexor tendon guard, and likewise an extensor tendon guard as explained previously, includes two cylindrical stop members 74 and 76, preferably made from a resilient material such as a plastic or rubber tubing or the like. The members 74 and 76 are mounted on a shaft or bar 78. A generally L-shaped mounting bracket 80 is provided having one leg 82 secured by fasteners 83 to web 20 adjacent the drum's end edge 26. The bracket 80 has a second leg 84 which extends outwardly from the end edge 26 and supports the shaft 78. Said leg 84 engages the shaft 78 approximately midway between the ends of the shaft 78, as best shown in FIGS. 1 and 3. Preferably, the shaft 78 includes two separate pieces which are threadingly connected through a hole in the leg 84. For newly made dermatomes, the L-shaped mounting bracket 80 and leg 82 can be formed as an extension of web 20, as an integral part thereof. Also, a single elongate stop member in place of the two members 74 and 76 is feasible.

The dimensions of the bracket 80, the shaft 78 and the members 74 and 76 are such that the stop members 74 and 76 each have a portion of the periphery thereof extending slightly radially outwardly from the outer surface 23 of the arcuate casting 22. A portion of each of the cylinders intercepts the path of movement of blade 39 and prevents blade 39 from moving past the free edge 26 of the drum whereby positively to prevent the knife edge 40 from engaging and cutting the wrist 90 of the surgeon, as best shown in FIG. 2. It is also noted that should the blade strike this guard, it will

strike flexible tubing, thus inflicting no damage to the blade itself.

The guard device 48 provides an effective and economical means for protecting the wrist 90 of the surgeon which is readily and easily installed on conventional instruments. Tee device 48 can be installed merely by drilling and tapping two holes in the drum casting 14, in the desired location for mounting as described and illustrated.

It is contemplated that variations and modifications can be made in the size, proportion of parts and construction of the safety guard devices 46 and 48 without departing from the intended functions and achieved objectives. It will be appreciated that minor modifications in the fasteners or mounting means for parts employed may occur to the skilled artisan without departing from the scope of the invention. Also, the invention contemplates easy replacement of worn-out parts of devices 46 and 48 where necessitated by long and extended use of the dermatome.

What is claimed and desired to be secured by Letters Patent of the United States is:

1. In a surgical instrument for skin grafting of the type which employs an elongate, central handle adapted to be held by one hand of the operator, a substantially semicylindrical drum coaxial with and spaced from the handle and having a curved circumferential surface terminating in opposed free edges which define therebetween an opening to receive said hand, a blade-mounting assembly supported by the handle for rotation about the axis of said handle and coaxial with said drum, a cutting blade mounted on said assembly for swinging movement along and spaced from said circumferential surface for separating desired areas of skin from a donor thereof to be adhesively secured to said surface, and means for adjusting the distance between the edge of said blade and said surface; the improvement comprising, safety guard means supported on said drum and extending circumferentially outwardly from one free edge thereof and spaced radially from said drum surface in the path of movement of said cutting blade whereby said blade is prevented from inadvertently contacting the wrist tendons of the operator.

2. The instrument according to claim 1 and further including an arcuate shield extending circumferentially outwardly from said other free edge of said drum and adapted to overlie the knuckle portion of said one hand to protect the same from contact with said blade-mounting assembly.

3. The instrument according to claim 1 wherein said safety guard means comprises a pair of aligned resilient members extending parallel to said free edge.

4. The instrument according to claim 2 wherein said shield extends from under said drum and includes a bar secured to the under surface of said shield and releasably secured to said drum.

5. The instrument according to claim 3 wherein said resilient members are cylindrical in configuration.

6. The instrument according to claim 5 wherein said cylindrical resilient members are mounted on a bar supported from the inside of the drum.

7. The instrument according to claim 6 and further including a generally L-shaped mounting bracket, said bar being mounted on one leg of said bracket and the other leg of said bracket being secured to the inside of said drum.

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