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H. I. BARNARD

3,070,091

SURGICAL SPLINT

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Fig. 1

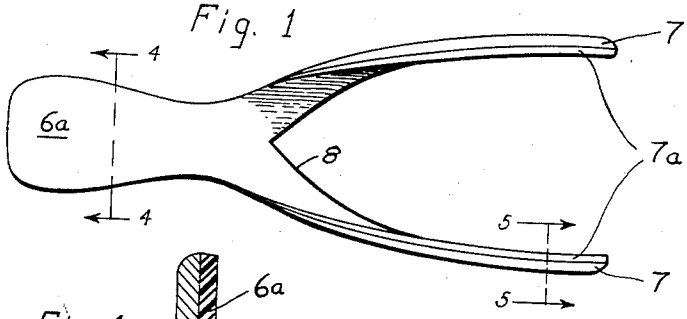


Fig. 4



Fig. 5





Fig. 2

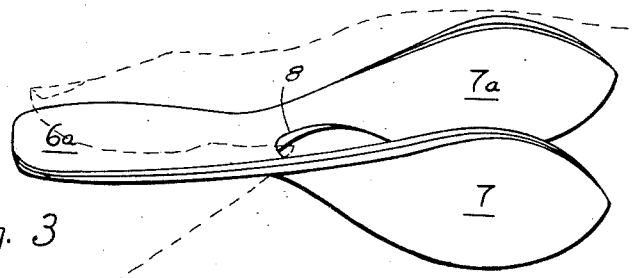


Fig. 3

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SURGICAL SPLINT

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This invention relates to surgical splints and more particularly to splints for fingers, thumbs and toes.

Various types of splints are used in the treatment of fractures and deformities of the thumb, fingers and toes. Some of these are preformed or prefabricated, and others are constructed or assembled piece by piece on the patient. However, the splints heretofore used for the treatment of thumbs, fingers and toes have permitted turning of the ends of the digit held in the splint to the discomfort of the patient and sometimes to the detriment of the surgery.

The present invention provides a departure from prior practice in having a bifurcated portion, one part of which lies against the palm of the hand or foot and the other part lies against a portion of the dorsum of the hand with a stem or splint disposed at about ninety degrees to the planes of each wing. The stem will act as a splint to the finger or thumb and the wings will stabilize to the finger or thumb and the wings will stabilize to the hand or foot as necessity may warrant. The material of said splint is sufficiently pliable or flexible to permit it to be bent or shaped to hold the digit in the desired position relative to the palm of the hand or the ball of the foot, while said wing portions prevent rotation or turning of the end which supports the digit. Preferably, the contact or supporting surfaces of the splint are covered with a soft, cushioning material, such as sponge rubber.

It is an object of my invention to provide a simple, durable and efficient splint for thumbs, fingers or toes which provides a comfortable and effective support, especially following the reduction of fractures or after surgery, and is especially designed to be used after bunion operations.

Another object of my invention is to provide a simple, durable and economical splint for thumbs, toes and fingers which can be produced in one or a few standard sizes and used with digits in a large variety of sizes and shapes and which can be formed or shaped in place to provide the desired support and to prevent rotation of the end of the enclosed digit.

Other objects reside in novel details of construction and novel combinations and arrangements of parts, all of which will be described in the course of the following description.

The practice of the present invention will be best understood by reference to the accompanying drawings illustrating a preferred embodiment of the features of the invention. In the drawings, in the several views of which like parts bear similar reference numerals:

FIG. 1 is a top plan view of a splint according to my invention;

FIG. 2 is a side elevation of the splint shown in FIG. 1;

FIG. 3 is a perspective view of the splint shown in FIG. 1, with the position of a fragmentary hand shown in dash lines, including the thumb disposed in an enclosed position within the splint;

FIG. 4 is a section taken along the line 4—4, FIG. 1; and

FIG. 5 is a section taken along the line 5—5, FIG. 1.

As shown in FIGS. 1 and 2, the splint of my invention comprises one flat end or stem portion 6 and bifurcated wing portions 7 extending outwardly from a curved crotch 8, the plane of end or stem portion 6 being disposed at approximately ninety degrees to the plane of the bifurcated portions 7, whereby a flat support is provided for reception of a digit under treatment. Preferably, a cushioning material such as foam rubber is affixed, as by an adhesive, as a covering 6a for portion 6 and a covering 7a for wing portions 7.

The material of the splint may be any suitable composition, but preferably is formed from aluminum sheet thin enough to provide the desired pliability or flexibility to permit it to be bent or formed into any final selected shape to provide the required support and enclosure for the digit; but it should have sufficient stiffness to provide the desired support and protection. The aforesaid support may include the application of cotton, gauze and surgical tape or the like to complete the enclosure, but the shaping of wing portions 7 will effectively prevent rotation of the outer end of the treated digit, which protection is not provided in conventional splints.

The splint of this invention may be produced in a variety of sizes, each of which will be effective in treating digits in various sizes. The outer end of each bifurcated portion is nearly circular in shape and of substantial width or diameter extending a considerable distance above and below the horizontal plane of the flat portion. These wide portions may be bent and shaped as required to give the necessary support throughout the length of the digit and to prevent rotation of its outer end. When final shaping is completed the bifurcated portion comprises an enclosure for a portion of the palm of the hand or ball of the foot, with one wing 7 on top of the hand or foot and the other wing on the palm of the hand or sole of foot as shown in FIG. 3.

In the form shown in the drawings, the splint comprises an integral assembly of wishbone shape and represents a preferred embodiment. However, it will be understood that if desired the splint may be formed of separated parts, suitably attached as by welding, in which event the flat horizontal portion may be composed of relatively stiff material, and so long as the extended wing portions possess the necessary flexibility for final shaping, satisfactory support and protection will be attained.

In use, the splint will have the flat portion of one wing placed in contact with the palm of the hand and the other wing placed in contact with the dorsum of the hand with the stem extending forward along the palm or the side of the finger or thumb. In the same way it can be used on the toes. The stem or splint part can be bent to maintain the finger or digit in the desired position of flexion or extension. Any desired bandaging may be applied around the splint and in the space between the wings to complete the dressing.

The splint of my invention is especially useful in treating certain deformities of the thumb, or big toe, as well as other digits of the hand or foot following the reduction of fractures or after surgery. It is particularly designed to be used after bunion operations. It may be sterilized as required, and when produced in a metal such as aluminum presents a clean-appearing surface which does not soil or discolor in normal use.

The provision of the soft surface covering affords comfort to the patient without sacrificing protection or support. While foam rubber has been described as a preferred composition of the covering, any material may be used which is soft and yieldable and is capable of bonding or permanent attachment to the metal of the splint.

Changes and modifications may be availed of within the scope of the invention as set forth in the hereunto appended claims.

I claim:

1. A surgical splint comprising a body terminating in a flat, normally horizontal portion at one end thereof, and substantially similarly shaped bifurcated portions extending from a curved crotch in said flat portion toward the other end of said body in planes disposed at substantially

ninety degrees to the plane of the flat portion, and said bifurcated portions being of substantially the same size and sufficiently flexible to form a shaped enclosure fitting against the palm of a hand or ball of a foot held against turning movement in the space between said portions.

2. A surgical splint comprising a flexible and deformable metallic body terminating in a flat, normally horizontal portion at one end thereof, and substantially similarly shaped bifurcated portions extending from a curved crotch in said flat portion in planes disposed at substantially ninety degrees to the plane of the flat portion toward the other end of said body, and said bifurcated portions being sufficiently deformable to be shaped to fit against the palm and dorsum of a hand as a stable anchorage for the flat portion supporting a digit of said hand.

3. A surgical splint comprising a body terminating in a flat, normally horizontal portion at one end thereof, substantially similarly shaped bifurcated portions extending from a curved crotch in said flat portion toward the other end of said body in planes disposed at substantially ninety degrees to the plane of the flat portion, said bifurcated portions being sufficiently deformable as to be capable of being molded to a fitted configuration against the palm of a hand or ball of a foot held against turning movement in the space between said portions, and a covering of yieldable material for the tissue-contacting surfaces of said body.

4. A surgical splint comprising a body of flexible yet deformable metal terminating in a flat, normally horizontal portion at one end thereof, bifurcated portions extending from a curved crotch in said flat portion toward the other end of said body in planes disposed at substantially ninety degrees to the plane of the flat portion, said bifurcated portions being nearly similar in shape and sufficiently flexible to form a shaped enclosure fitting against the palm of a hand or ball of a foot held against turning movement in the space between said portions, and a foam rubber covering for the tissue-contacting surfaces of said body.

5. A surgical splint comprising a generally wishbone shaped body terminating in a flat portion at one end thereof and having two substantially uniform and parallel flat portions extending rearwardly from the inner end of the flat portion for supporting a digit of a hand or a foot, and the portions extending rearwardly from said flat portion being spaced sufficiently to bear against the palm

of a hand or ball of a foot and being sufficiently deformable to be molded to a fitted configuration on said palm or ball so as to form a stabilized anchorage for the portion supporting said digit.

6. A surgical splint comprising a flexible, deformable body terminating in a flat, normally horizontal portion at one end thereof and substantially uniform bifurcated portions extending from a curved crotch in said flat portion toward the other end of said body in planes disposed at substantially ninety degrees to the plane of the flat portion, and said bifurcated portions being generally circular in shape and varying from a minimum vertical dimension near said crotch with gradual increase to a maximum vertical dimension at a point spaced from said crotch and near the extended end of said bifurcated portions.

7. A surgical splint comprising a flexible and deformable thin, sheet-like body having an elongated normally planar portion at one end, an integral bifurcated portion at the opposite end, each of the wings of the bifurcated portion extending longitudinally from spaced-apart positions at an end of said planar portion, said wings being interconnected to said planar portion along a curved crotch, each of said wings being of similar nearly circular shape and varying from a minimum dimension near said crotch to a maximum dimension at a point distant from said crotch, the length of each said wing being greater than the length of said planar body, and the plane of said wings being disposed at substantially ninety degrees to the plane of the planar body.

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