United States Patent [19]

Malmin

[11] **3,742,943**

[45] **July 3, 1973**

[54] **RHINOPLASTY TREATMENT, METHOD, AND APPARATUS**

[76] Inventor: **Oscar Malmin,** 127 E. Wayne Avenue, Akron, Ohio 44301

[22] Filed: **Jan. 3, 1972**

[21] Appl. No.: **214,614**

[52] **U.S. Cl.** ..... **128/76 C,** 128/89 R

[51] **Int. Cl.** **A61f 5/08**

[58] **Field of Search** ..... 128/76 R, 76 C, 90, 128/89, 132

[56] **References Cited**

UNITED STATES PATENTS

3,594,813	7/1971	Sanderson	128/132 R
3,426,751	2/1969	Radewan	128/76 R
3,680,548	8/1972	Brown	128/90
3,585,639	6/1971	Enicks	128/90 X

FOREIGN PATENTS OR APPLICATIONS

335,425	7/1904	France	128/76 C
12,055	1/1910	France	128/76 C
321,737	6/1920	Germany	128/76 C

Primary Examiner—Richard A. Gaudet
Assistant Examiner—J. Yasko
Attorney—Freeman & Taylor

[57] **ABSTRACT**

A method, and the apparatus for carrying out the method, for post-operative treatment of rhinoplasty patients. The method includes the preparation of a "before" cast of the patient's nose and preparation of an "after" configuration or model of the nose so that the patient can see the expected results. One version of the method includes forming a progressive series of splints of differing contours intended to compensate for the reduction of swelling in the period following surgery, with these splints being formed to conform with the step-by-step models until the ultimate nose configuration is achieved. The method also contemplates securing the splints to the head of the wearer by a headband which would be of the cervical or low pull type so that proper pressure is applied by the splints during the time they are in place without causing discomfort to the wearer. The preferred form of splint contemplates using a universally adaptable form thereby precluding the necessity of "step-by-step" molding as previously stated.

8 Claims, 18 Drawing Figures

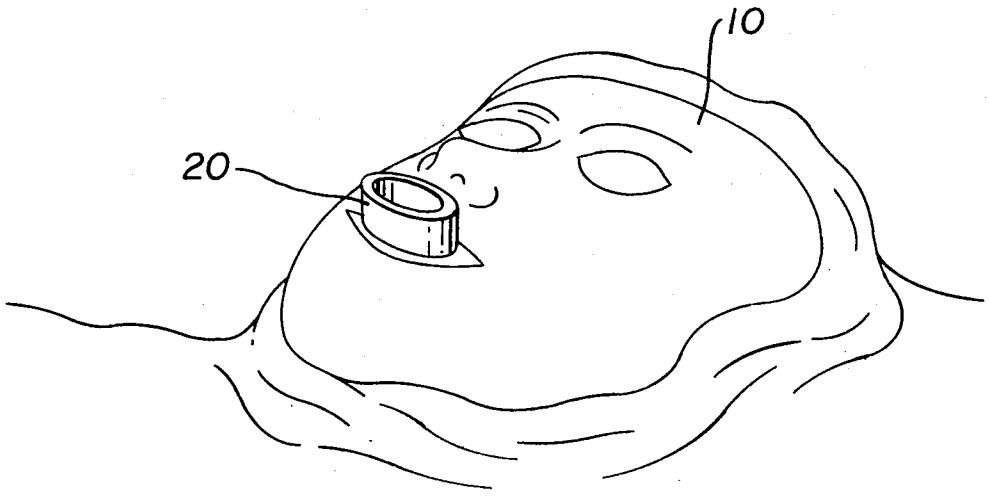
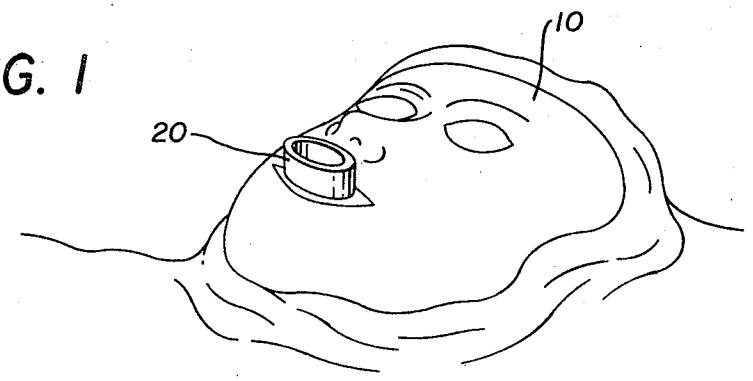


FIG. 1



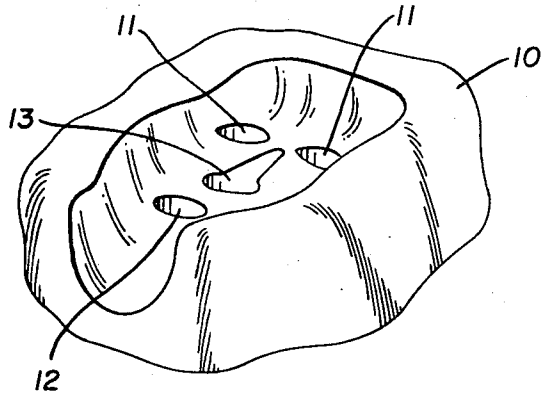


FIG. 2

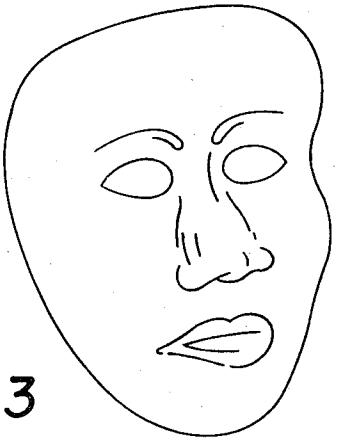


FIG. 3

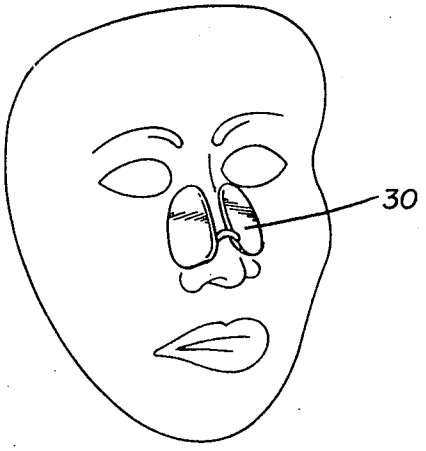


FIG. 5

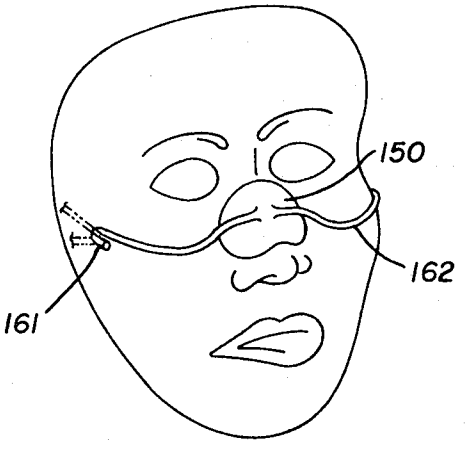


FIG. 4

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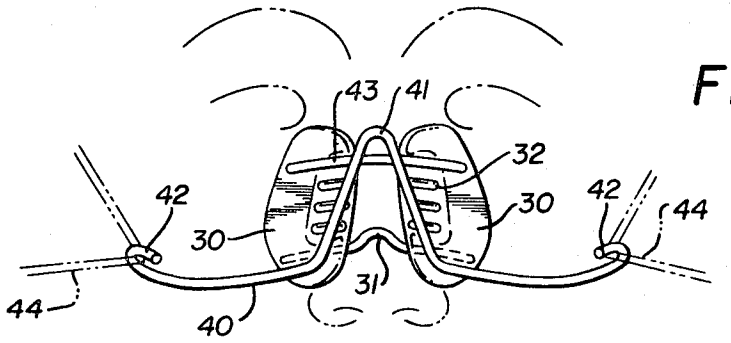

FIG. 6

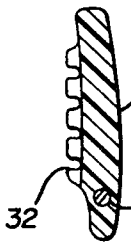

FIG. 9

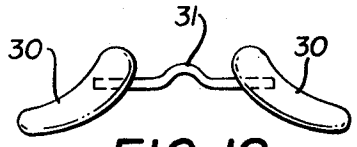

FIG. 12

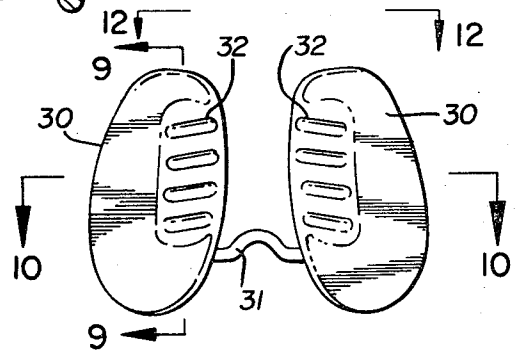

FIG. 7

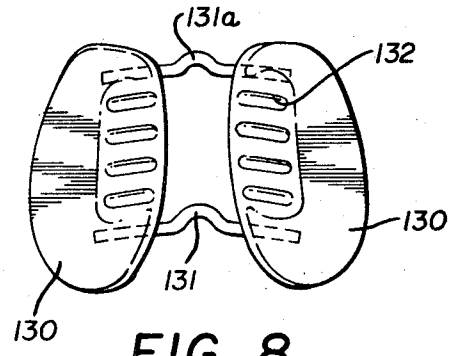

FIG. 8

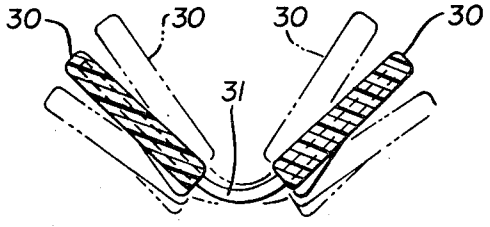

FIG. 10

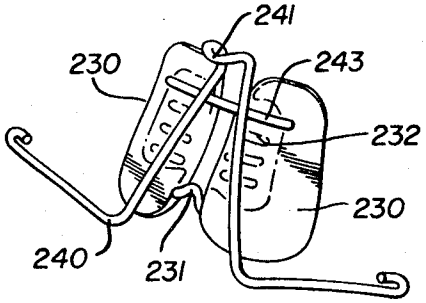

FIG. 11

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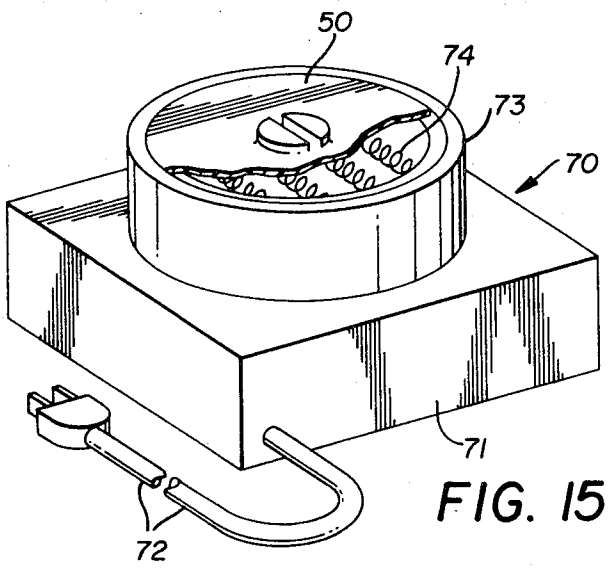

FIG. 15

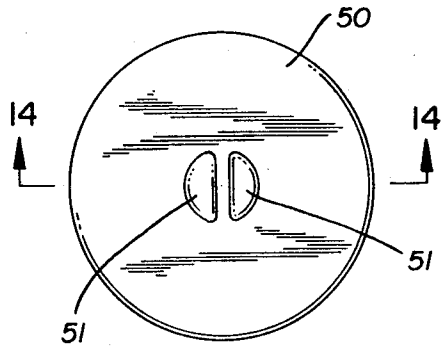

FIG. 13

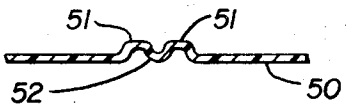

FIG. 14

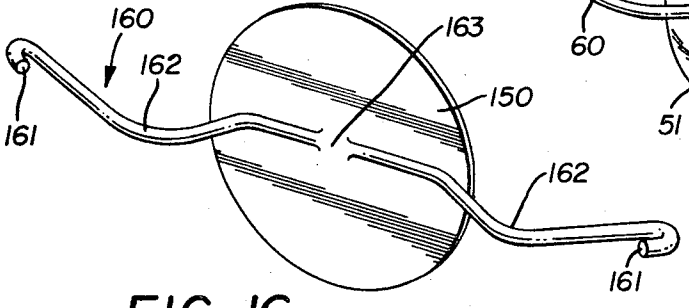

FIG. 16

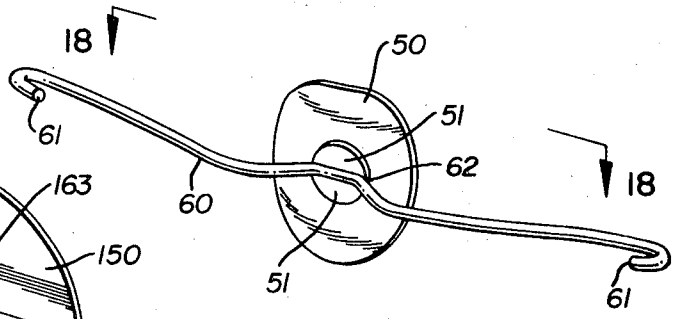

FIG. 17

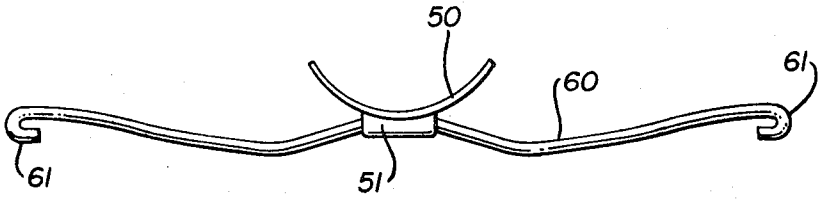

FIG. 18

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RHINOPLASTY TREATMENT, METHOD, AND APPARATUS

BACKGROUND OF THE INVENTION

The invention, in general, relates to the medical field of rhinoplasty or plastic surgery relating to the nose and, in particular, relates to a system of predetermining the ultimate desired configuration of the nose following surgery and healing, and relates to methods of accurately and comfortably splinting the nose during the healing process.

DESCRIPTION OF THE PRIOR ART

The following patent prior art is known to Applicant:

Lowman	U.S. Pat. No. 1,062,654
Hilgers	U.S. Pat. No. 1,378,455
Benjamin	U.S. Pat. No. 1,715,027
Dawn	U.S. Pat. No. 2,124,767
Kosior	U.S. Pat. No. 2,882,892
Radewan	U.S. Pat. No. 3,426,751
Grove	U.S. Pat. No. 3,512,184

While a number of the above-noted patents do disclose various methods of making molds or casts of parts of the body to obtain a desired configuration, none of them appear to disclose a precise molding method and use contemplated by Applicant, and further none of them disclose the unique splinting structure and system, and none show the preferred universally adaptable form of splint contemplated by Applicant.

Applicant is also aware of the present method of post-operative treatment of rhinoplasty patients, which is to utilize a lightweight aluminum splint that fits over the nose and then is simply taped to the face. It is believed that this method is unsatisfactory primarily because it is very difficult to keep the piece in place due to movement on the part of the patient.

Further, the broken nasal bones are not stabilized to encourage rapid and proper healing as is the case in other cases of fracture treatment.

Additionally, there is no easy selectability of areas of needed pressure to properly assure the "molding" effect desired by the operation.

SUMMARY OF THE INVENTION

This invention contemplates a method of first preparing a cast or model of the patient's nose prior to surgery. A "before" and "after" model can then be obtained, and the "before" model can then be shaved or pared down to conform to the progressive reduction in swelling, which would normally be encountered following surgery, ultimately arriving at a final configuration for the nose which is the cosmetic object of the operation.

In conjunction with each trimming of this model, a plurality of splints are employed, and these splints can be contoured so that there will be a specific splint for each stage of the model. In this fashion it is contemplated that periodic visits of the patient to the surgeon will permit replacement of the splints on a regular and reducing basis so that they will closely conform to the desired configuration of the nose at the various stages of healing.

It is contemplated that the splints may be of either two-piece construction or may be of a preformed blank which can simply be heated and then formed to the desired configuration.

If a two-piece splint with opposed splint members interconnected by flexible cross-pieces is employed, the model can be eliminated and the progressive adjustment can be achieved by simply bending the cross-pieces and/or heating and shaping the splint member.

It is further contemplated that the splints, in contrast to the prior art, would be held on the head of the user by utilization of a headband similar to that used in orthodontics, with the headband being of the cervical or low pull type or a combination high-low pull so as to securely hold the splints in place without discomfort to the patient and also so as to apply the pressure in the desired direction and on the desired areas.

Accordingly, production of a method and apparatus for carrying out that method of the character just described becomes the principal object of this invention, with other objects thereof becoming more apparent upon a reading of the following brief specification and claims considered in view of the accompanying drawings.

OF THE DRAWINGS:

FIG. **1** is a perspective view showing the original casting made of the patient's face.

FIG. **2** shows the reverse side of the cast of FIG. **1**.

FIG. **3** shows the model formed by use of the cast of FIG. **2** in the "before" configuration.

FIG. **4** is a view similar to FIG. **3** but showing the model which has been shaped to the desired "after" configuration.

FIG. **5** shows application of the splint to the model.

FIG. **6** is an elevational view showing one form of the splint in place on the patient.

FIG. **7** shows an elevational view of one form of the splint by itself.

FIG. **8** shows an elevational view of a modified form of splint.

FIG. **9** is a sectional view taken along the lines **9—9** of FIG. **7**.

FIG. **10** is a sectional view taken along the lines **10—10** of FIG. **7**.

FIG. **11** is a perspective view of a splint showing a modified form of attachment means.

FIG. **12** is an end view taken along the lines **12—12** of FIG. **7**.

FIG. **13** is a plan view of a modified form of preformed splint.

FIG. **14** is a sectional view of the splint of FIG. **13** taken along the lines **14—14** thereof.

FIG. **15** is a perspective view showing a heating element for use in conjunction with the form of splint shown in FIG. **13**.

FIG. **16** is a perspective view of a modified form of splint.

FIG. **17** is a perspective view of a still further modified form of splint.

FIG. **18** is a view of the splint of FIG. **17** taken along the lines **18—18** thereof.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

Considering first FIGS. **1** through **5** in describing the method of forming the moulage and the model, it will first be assumed that the patient's face has been prepared by lubricating it with a suitable material to avoid harm to the face when the cast is made. Furthermore, a plastic airway **20** will have been placed in the mouth

of the user. Following this, the exposed area of the face will be covered with one layer of a gauze impregnated with a suitable fast-setting material, such as alginate, and three additional layers of fast-setting plaster bandage will be applied. After the gauze-alginate and plaster bandage layers have set up, a moulage similar to that indicated by the numeral **10** in FIG. **1** will be achieved.

Referring to FIG. **2**, It will be seen that by reversing this moulage, a mold will, in effect, have been formed including depressed areas **11,11** for the eyes, **12** for the mouth, and **13** for the nose.

The next step in the method is to make the face models, paying particular attention to the nose area.

The models are formed by filling the moulage **10** with plaster and pouring it into the impression.

After the plaster has set, the impression or model is removed, and of course any number of such models can be obtained. At least one of these models, as shown in FIG. **3**, will be the "before" model, which shows the nose in its configuration prior to surgery. Furthermore, at least one of the models, as shown in FIG. **4**, will be the "after" model which will show the nose in the configuration it is anticipated will be taken following completion of the surgery and the healing process. Any number of intermediate models could, of course, be made if desired.

Turning first then to the form of the splint which would be used in conjunction with the model, attention is called to FIG. **13** where it will be noted that a preformed blank **50** of plastic or some suitable and which is bent or deformed in its central portion so as to provide raised areas **51,51** and a depressed central area **52** (see FIG. **14**) is disclosed.

In this form of the invention the heating element, generally indicated by the numeral **70** is utilized. This heating element consists of a base **71**, an electrical cord **72**, and a heating chamber **73** which contains a plurality of heating coils **74,74.** In utilization of the type splint disclosed in FIGS. **13** and **14**, it is simply necessary to activate the heating device **70**, place the blank **50** thereon and heat it until it becomes pliable. Following this it would, of course, be placed over the model and contoured to the desired configuration.

In this regard, one splint will be formed, and then the model will be pared down to represent the first stage of swelling reduction and another splint will be prepared. This process can be repeated as often as the surgeon thinks necessary until the "after" configuration is arrived at, with the series of splints so formed being fitted to the patient during periodic follow-up visits.

After the splint is formed, it is then necessary to apply a restraining member **60**, as shown in FIG. **17**, which has its central portion **62** received in the depression **52** of the blank, and with the ends **61,61** being secured to a resilient member (not shown) which passes around the head as will be described below with regard to FIG. **6.**

FIG. **18** shows a top view of the splint of FIG. **17** with the restraining member **60** in place.

FIG. **16** shows a similar splint assembly except that the restraining member **160** is integral with the blank **150.** Again the blank or blanks would be heated and then shaped to the desired configuration as described above in connection with the blank of FIGS. **13** and **14.** It will be noted that the restraining member **160** is deformed at **162,162,** and the purpose of this is to avoid obscuring the wearer's field of vision.

Turning next then to FIG. **6** for a description of a modified form of splint, it will be seen that the splint shown in that figure consists of a pair of opposed splint members **30,30** of plastic or similar material which have an arched connecting wire **31** embedded in them and which also have, on their outer surfaces, a plurality of locating notches **32,32.** The splint is, of course, held in place on the face of the wearer by the holding member **40,** which is a wire member bent back upon itself at its ends **42,42** and having a V-shaped central portion **41.** Secured to the holding member **40** is a cross-piece **43** which will fit into the locating notches, and in this regard it is contemplated that, depending upon where the most pressure is desired, the cross-piece **43** can be selectively located in any of the notches **32,32.**

The holding member **40** has its ends **42,42** connected to an elastic member **44,44** which is similar to the headband of an orthodontic cervical type which passes around the head of the wearer and can be adjusted to securely hold the splint in place.

FIG. **8** shows a modified form of the splint with a pair of opposed splint pieces **130,130** containing the locating notches **132,132,** but also in this case having two connecting members **131** and **131***a* embedded therein.

FIG. **11** shows a splint similar to that shown in FIGS. **6** trough **10** with central portion bent down as a modified form of restraining member **240.** This member is similar to that of FIG. **6** but has its to at **241** to minimize visual obstruction to the wearer. In using this form of splint, it is simply necessary to place it over the selected model and then deform it to the desired configuration, with it being understood again that it is contemplated that a progressive series of splints will be used during the healing process.

In this form of the invention the model is not required. The splint can be deformed to conform to the nose configuration at the various stages of healing by simply deforming the cross-pieces **31, 131,** or **231,** as shown in FIG. **10,** for example.

It is also possible to modify the configuration of the splint members **30,30, 130,130,** and **230,230** if desired by heating them until they become pliable and then shaping them as desired.

It is submitted, therefore, that a unique, practically fool-proof method of post-operative rhinoplasty care and the apparatus for carrying out that method have clearly been set forth above. By this method the surgeon's time is believed to be reduced inasmuch as most of the steps, except actually shaping the models, can be handled by para-medical personnel. It is also believed that the patient gains an advantage from this system in that he is able to see the ultimate desired result before surgery is performed, and further the patient is believed to benefit because of the increased comfort since it is believed apparent that applying splints in the fashion described herein would definitely result in improved comfort over the present tape-on method. Additionally, there is assurance that the proper molding and splinting pressures achieve the desired end result.

While a full and complete description of the invention has been set forth in accordance with the dictates of the Patent Statutes, it is to be understood that modifications can be resorted to without departing from the spirit hereof or the scope of the appended claims.

Thus, for example, no great detail has been set forth with regard to the making of the moulage of the patient's face prior to beginning the treatment inasmuch as it is believed that any system by which a mold of the pertinent features of the face can be made would be satisfactory.

Similarly, the method of making the models has not been discussed in great detail because any suitable model-making material or method would be satisfactory so long as an accurate model is achieved.

What is claimed is:

1. A rhinoplasty splint device, comprising;
A. a pair of opposed splint members;
B. at least one bendable elongate interconnecting member having its opposed ends secured to said splint members; and
C. a plurality of locating notches disposed on one face of each of said splint members and;
D. retaining means cooperating with said locating notches and including means adapted to engage the head of the wearer.

2. The device of claim **1** further characterized by the fact that said splint members are deformable when heated.

3. The device of claim **1** further characterized by the fact that said retaining means releasably engage said locating means.

4. The device of claim **3** wherein said retaining means include
A. an elongate wire;
B. an arm projecting from said wire substantially normal to the longitudinal axis thereof; and
C. an elongate locating bar
1. affixed to the outboard end of said arm in substantial parallelism with said wire and
2. being of sufficient diameter for its ends to fit within opposed locating notches.

5. The device of claim **4** further characterized by the presence of
A. attachment means disposed on the opposed ends of said wire; and
B. an elongate elastic member adapted to have its opposed ends connected to said attachment means and encircle the head of the wearer.

6. A method of post-operative rhinoplasty treatment, comprising the steps of;
A. forming a mold of the patient's nose and face;
B. forming a first splint which conforms to the model configuration;
C. trimming the model periodically to reflect the lessening of swelling during the healing period and forming a series of splints to reflect said periodic alteration in size;
D. applying the series of splints so formed to the patient periodically until the final nose configuration is obtained and holding said splints on the head of the patient by resilient retaining means.

7. A rhinoplasty splint device, comprising;
A. a moldable splint body
1. contoured to conform to the outer nasal configuration of the patient's nose; and
B. means carried by said body for retaining said splint body on the nose of the patient including
1. a locating notch on one face of said splint body,
2. a restraining member releasably secured to said locating notch, and
3. an elongate elastic member
a. secured to said restraining member and
b. adapted to encircle the head of the wearer.

8. A rhinoplasty splint device, comprising;
A. a moldable splint body
1. contoured to conform to the outer nasal configuration of the patient's nose; and
B. means carried by said body for retaining said splint body on the nose of the patient including
1. a restraining member including an elongate rigid member secured to one face of said splint body with its opposed ends projecting beyond the edges of said splint body, and
2. an elongate elastic member secured to the opposed ends of said restraining member and adapted to encircle the head of the wearer.

* * * * *