Feb. 14, 1967 R. J. HAMM 3,304,145

OPHTHALMIC MOUNTING WITH ADJUSTABLY MOUNTED PLIABLE BRIDGE

Filed April 5, 1960

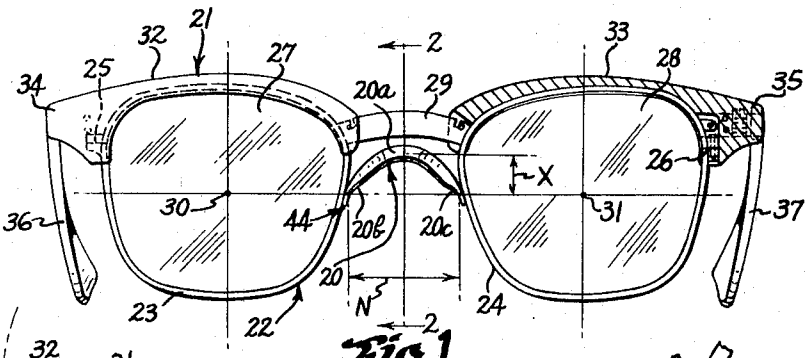


Fig. 1

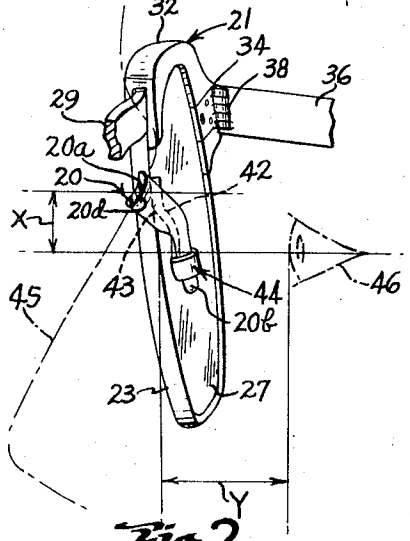


Fig. 2

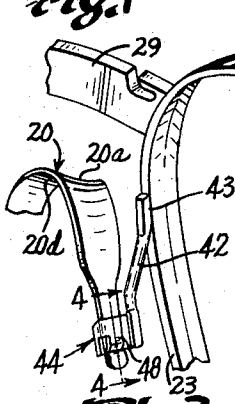


Fig. 3

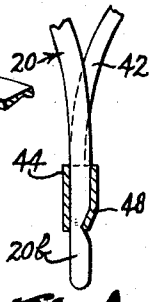


Fig. 4

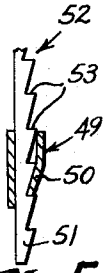


Fig. 5

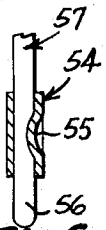


Fig. 6

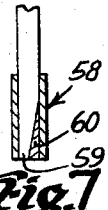


Fig. 7

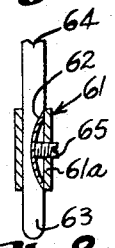


Fig. 8

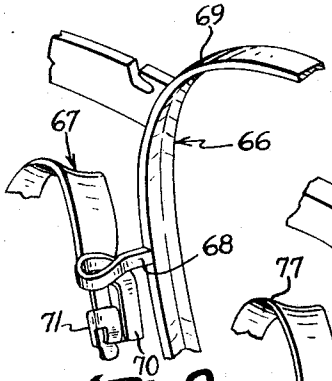


Fig. 9

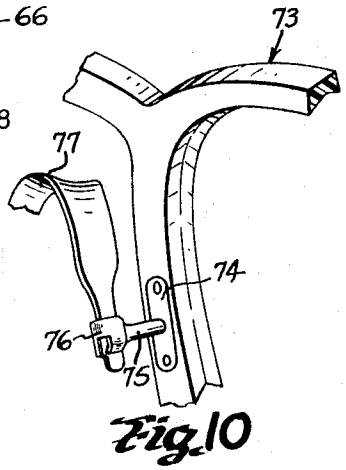


Fig. 10

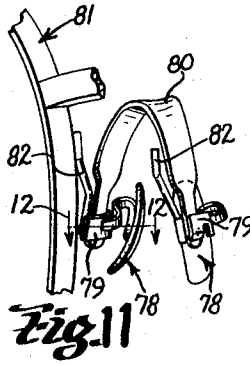


Fig. 11

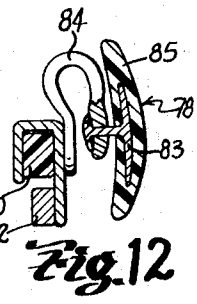


Fig. 12

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OPHTHALMIC MOUNTING WITH ADJUSTABLY MOUNTED PLIABLE BRIDGE

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2 Claims. (Cl. 351—130)

This invention relates to ophthalmic mountings and has particular reference to novel and improved structures for the nasal areas of ophthalmic mountings.

A principal object of the present invention is to provide improved bridge structures for ophthalmic mountings which provide more comfortable and secure nasal supporting means for said mountings when in use and are pleasing in appearance, simple in design and economical to produce.

Another object is to provide novel adjustable saddle type bridge structures which are adaptable to ophthalmic mountings of substantially all conventional designs and by means of which the mountings may be easily, quickly and accurately adjusted to permanent properly aligned relation with the eyes of a wearer while, at the same time, comfortably fitted to the face.

Another object is to provide an ophthalmic mounting having a saddle type bridge construction of the above mentioned adjustable type which is formed of a gentle non-irritating self-conforming material so contoured and arranged at the nasal area of the mounting as to bear comfortably against the less sensitive forward portion of the nose of the wearer when in use, and thereby direct the weight of said mounting to said less sensitive nasal area of the face.

Another object is to provide, as a part of a saddle or sling type bridge construction of the above character, novel means for attaching the same to the nasal section of an ophthalmic mounting and for permitting ready adjustment of said bridge construction relative to the supporting parts of said mounting in conformity with the individual face fitting requirements of a prospective wearer thereof.

Another object is to provide a sling type nose engaging structure of the above character for ophthalmic mountings or the like, which produces an unusual style effect and further permits unlimited redesigning or further restyling of the nasal area of ophthalmic mountings for producing desired aesthetic effects heretofore unobtainable with the fixed and relatively prominent conventional nose engaging parts of conventional ophthalmic mountings.

Another object is to provide an improved saddle type nasal construction for ophthalmic mountings which is unique in its adjustability and self-confromity in meeting face fitting requirements and provides maximum comfort and security of fit when in use upon the face of a wearer.

A further object is to provide an ophthalmic mounting having a structure of the above-mentioned character which is commercially attractive and enhances the aesthetic value of the mounting by reason of its neat and trim appearance when in a position of use.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a front elevational view of an ophthalmic mounting embodying a perferred form of the invention;

FIG. 2 is an enlarged cross-sectional view taken substantially along line 2—2 of FIG. 1 looking in the direction indicated by the arrows and diagrammatically illustrating the fitting characteristics obtainable with the arrangement of the invention;

FIG. 3 is an enlarged fragmentary rear perspective

view of the embodiment of the invention shown in FIGS. 1 and 2;

FIG. 4 is a cross-sectional view taken substantially along line 4—4 of FIG. 3 looking in the direction indicated by the arrows;

FIGS. 5–8 are diagrammatic cross-sectional views of various modified bridge securing arrangements which are applicable to any of the several illustrated forms of the invention;

FIGS. 9 and 10 are fragmentary rear perspective views of ophthalmic mountings embodying alternate forms of the invention;

FIG. 11 is a fragmentary front perspective view of an ophthalmic mounting embodying a further modification of the invention; and

FIG. 12 is an enlarged cross-sectional view taken substantially on line 12—12 looking in the direction indicated by the arrows.

Referring more particularly to the drawings wherein like characters of reference designate like parts throughout the several views, there is shown in FIGS. 1–4 a preferred form of the invention which embodies a flexible self-conforming saddle or sling type bridge 20 and supporting means therefor which is adaptable to various different types of conventional ophthalmic mountings.

The mounting 21, which has been shown for purposes of illustration, is of the so-called zyl-metal combination type and embodies a metallic frame front 22 consisting of a pair of internally V-grooved lens rims or eyewires 23 and 24 which are split at 25 and 26 respectively. Each of the eyewires 23 and 24 are adapted to receive and securely support bevel edged lenses 27 and 28 in the conventional manner when said lenses are edge fitted therein and the respective split ends of the eyewires are clamped tightly together with the usual connecting screws or the like, not shown. The eyewires 23 and 24 are joined together in fixed predetermined spaced side-by-side relation with each other by means of a rigid metallic cross bar 29 which is soldered or otherwise securely connected at each of its opposite ends to the respective eyewires 23 and 24 adjacent the uppermost or top edges of the said eyewires as shown in FIG. 1. The cross bar 29 size is of a predetermined length selected in accordance with the facial characteristics of a prospective user of the frame so as to provide a nasal space N (see FIG. 1) between the eyewires 23 and 24 which is of a dimension somewhat greater than the width of the user's nose taken at a point adjacent the location where the respective facing edges of the eyewires will ultimately be positioned when the mounting 21 is in use. Furthermore, the eyewire and cross bar 29 sizes are also preselected in known manner so as to place the geometrical center points 30 and 31 of the lenses at a predetermined spaced distance from each other in accordance with the interpupillary distance of the user's eyes. It will be noted as this description progresses that the rigid cross bar 29 forms no other function than to integrate the eyewires 23 and 24 so as to form a relative rigid frame front 22. That is, the rigid cross bar 29 does not bear against a user's face when the mounting 21 is in use or in any way support the weight of the mounting when it is in use. This is solely the function of the flexible saddle bridge 20 of the invention without contribution from the rigid cross bar 29.

The frame front 22 is provided with a pair of grooved plastic brow sections 32 and 33 which are fitted over and fixed to the upper edges of the respective eyewires 23 and 24. The brown sections 32 and 33 extend from the cross bar 29, to which they are attached, across the top edges of their respective eyewires to the opposing side edges thereof where they terminate as enlarged endpieces 34 and 35 respectively and are again attached to

the eyewire parts. Rearwardly directed temples **36** and **37** are pivotally connected to the respective endpieces **34** and **35** in the conventional manner with hinges **38** or the like, see FIG. 2.

In order to support the nasal section of the mounting **21** securely, comfortably and accurately on the face of a wearer, the present invention provides the above-mentioned flexible saddle type bridge **20** which is relatively wide throughout its intermediate section **20***a* and narrows toward each of its opposite ends so as to provide a pair of legs **20***b* and **20***c* by means of which the bridge may be initially adjusted on the mounting **21** and then secured thereto as will be described presently.

The saddle bridge **20** is formed of a flexible self-conforming type of material such as nylon, vinyl or other pliable plastics or may be formed of leather, synthetic leather, neoprene or rubber. In all cases, the material selected for the making of the saddle bridge **20** must meet the following requirements: said material must be pliable and self-conformable, but it should not possess any appreciable elastic characteristics; it must be non-irritating to the facial tissue of a user and its pliable characteristics and coloring must be relatively stable over long periods of use and not appreciably affected by body secretions.

The saddle bridge **20** may be cut to shape from sheet stock having the above-desired characteristics or preferably molded to the particular shape shown more in detail by FIG. 2 wherein it is provided with a slightly convex inner surface **20***d* which is to rest against the nose of a wearer. If desired, the said inner surface **20***d* of the saddle bridge **20** may be scored or otherwise treated to produce a non-irritating non-slip surface which will allow some ventilation between it and the skin area upon which it rests when in use. It is also pointed out that in order to lend added stability to certain very soft materials which might be used in the fabrication of the saddle bridge **20**, the said materials may be laminated over reinforcing means such as fabric, malleable wires or wire mesh or the like. It is also pointed out that for most uses, the bridge **20** is formed to a width of approximately 4 mm. across the widest part of its midsection **20***a* although it may, in some cases, be 8 to 10 mm. or even wider particularly in instances where it might be desired to use the bridge as protective or shielding means for the nose of a wearer to avoid sunburn or other excessive heat radiations if, for example, the bridge construction of the invention were used as nasal supporting means for industrial or sports goggles or the like.

The saddle bridge **20** is attached and fixedly supported on the mounting **21** preferably by means of elongated relatively rigid but bendable metallic arms **42** (see FIGS. 2–4) which will hereinafter be referred to as guard arms. The guard arms **42** are soldered or otherwise attached at **43**, one to each of the rear edges of the respective metallic eyewires **23** and **24**, and depend to approximately the horizontal geometrical centerline of the said eyewires. At the free end of each of the guard arms **42** there is provided a metallic connection box **44** through which the legs of the saddle bridge **20** are extended and attached as will be presently described. The boxes **44** are soldered or otherwise fixedly secured to their respective guard arms and have tubular openings therethrough into which the legs **41** and **42** of the saddle bridge **20** are extended as shown in FIGS. 1–4.

In adjusting the bridge **20**, prior to the securing of its legs permanently in the boxes **44**, a measure is taken of the distance X (see FIGS. 1 and 2) between the boxes **44** and the point where the surface **20***d* of the bridge is to ultimately engage the nose **45** of a wearer (see FIG. 2). This distance X should be such as to locate the mounting **21** vertically upon the face in such a position as to place the axes of the respective lenses **27** and **28** approximately in line with the wearer's eyes **46** (see FIG. 2). Knowing the point where the bridge **20** is to rest on the nose **45**, this measure may be made with a scale or alternatively, with the bridge legs **20***b* and **20***c* extended loosely through the boxes **44**, a temporary fitting of the mounting to the face of a prospective user may be made and upon removal of the mounting from the face, the bridge legs **20***b* and **20***c* would be secured permanently in place. Increasing or decreasing the dimension X is accomplished simply by sliding the bridge legs **20***b* and **20***c* simultaneously up or down through the boxes **44**, with said boxes and legs having sufficient frictional contact to temporarily retain the adjustments. Also, in order to provide for a proper fitting of the mounting, the distance Y (see FIG. 2) between the eyes **46** and the inner side surfaces of the respective adjacent lenses **27** and **28** is adjusted by a forward or rearward bending of the guard arms **42**.

The fitting dimensions X and Y and the spacing of the boxes **44** must be relatively accurately determined before the bridge is secured in said boxes **44** and the said dimensions may be arrived at by any known expedient such as scaler measure or actual face fitting before the securing of the bridge ends **20***b* and **20***c*.

With the saddle bridge **20** properly adjusted in the boxes **44** the respective legs **20***b* and **20***c* thereof are rigidly secured in place and any unwanted material of the said bridge legs which extends below the boxes **44** is trimmed off.

Securing of the bridge legs **20***b* and **20***c* may be accomplished simply by cementing them in the boxes **44**. However, a preferred securing arrangement would be that illustrated in FIGS. 1–4 or FIGS. 5–8.

In FIGS. 1–4, the boxes **44** are provided with bendable tab parts **48** which are bent by squeezing with pliers or the like into holding relation with the said bridge legs **20***b* and **20***c*.

In FIG. 5 there is shown a connection box **49** similar to the above-described boxes **44** having a bendable tab **50** which again is forced against the end part or leg **51** of a saddle bridge **52**. The bridge **52** is identical to the above-described bridge **20** with the exception of its end parts or legs **51** which are serrated along their outer sides at **53**. The serrated or saw-toothed sides **53** of the bridge **52** are engaged by tabs **50** of the type shown in FIG. 5 to positively prevent any upward displacement of the bridge **52** in the box **49**. It is pointed out that the tabs **50** may be initially inwardly bent as shown in FIG. 5 and spring tempered to render them resilient. In such a case, the serrated bridge legs may be adjusted to any desired fixed position in the boxes **49** by simply forcing them through the boxes **49** wherein the spring tabs will automatically snap into the serrations to securely hold the bridge in a desired adjusted position.

In FIG. 6 an alternate type of connection box **54** is shown as being indented at **55** to press into and clamp an end or leg **56** of a bridge **57** which is identical to the bridge **20**. Indentation of the box **54** at **55** may be accomplished by striking the same with a suitable punch or the like.

In FIG. 7 there is shown a further modification of bridge connecting means wherein a connection box **58** without a tab or other bendable parts is used. A bridge end part or leg **59**, when properly adjusted in the box **58**, is clamped into place with a suitable wedge **60** formed of metal, wood or hard plastic or the like.

In FIG. 8, the connection box **61** is provided with an internal shoe **62** formed of a relatively thin spring-like material which is wedged against the end part or leg **63** of a bridge **64** by means of an adjustable set screw **65** to produce a clamping of the bridge **64**. The set screw is threaded through the side **61***a* of the connection box **61**.

It is pointed out that the flexible bridge parts **52**, **57**, **59** and **64** which were referred to with relation to FIGS. 5–8 are identical to the above described bridge **20** of FIGS. 1–4 with the exception of the particular end part or leg **50** of the bridge **52** shown and described with relation to FIG. 5 and it is further pointed out that any one of the connection box arrangements shown in FIGS. 5–8 may be

used to replace the first described connection boxes **44** of FIGS. 1–4.

Other modifications of the invention are illustrated in FIGS. 9–12 wherein, in FIG. 9, there is shown a fragmentary portion of a metallic spectacle frame **66** embodying a flexible sling or saddle type bridge **67** which is identical to the bridge **20** of FIGS. 1–4. The frame **66**, however, is provided with a substantially horizontally extending bendable metallic guard arm **68** soldered to the rear edge of the frame eyewire **69**. The guard arm **68** is formed to a looped shape intermediate its opposite ends so as to cause its free end **70** to depend as shown. A connection box **71** which may be of any one of the above described types is provided at said free end **70** of the guard arm **68** into which the bridge is inserted and secured as outlined above. With a structure such as shown in FIG. 9, it can be seen that adjustment of the bridge **67** relative to the frame front **66**, for face fitting purposes, can be made after the bridge **67** is securely locked in the connection boxes **71**. That is, the bridge can be raised or lowered by bending the horizontally disposed portion of the guard arm **68** and it can be also moved toward or away from the eyewires **69** by bending the depending section of said guard arm **68** forwardly or rearwardly. It is pointed out that this latter adjustment can easily be made on the device of FIGS. 1–4 but that a vertical adjustment of the arrangement of FIGS. 1–4 cannot be made as readily after the bridge **20** is secured in the boxes **44**. Thus, with the arrangement of FIGS. 1–4, it is desirable to initially set the bridge **20** at a desired height before clamping the same in the boxes **44**. This, however, is not essential to the fitting of a mounting such as shown in FIG. 9.

In FIG. 10 there is illustrated an all plastic spectacle frame or ophthalmic mounting **73** having a guard arm mounting plate **74** riveted, cemented or otherwise secured thereto adjacent its nasal section. To the plate **74** there is soldered a guard arm **75** having a bridge connecting box **76** attached to its free end and a flexible saddle bridge **77** of the type described hereinabove secured in the box **76**. In this modification of the invention, it can be seen that vertical adjustment of the bridge **77** can be made, within practical limits, by bending the arm **75** up or down. It should be understood that, if it is so desired, the arm **75** may be of any preformed bent or looped shape such as shown in FIG. 9, for example, to permit both horizontal and vertical adjustment of the bridge after it is secured in the connection box **76**.

A still further modification of the invention is shown in FIGS. 11 and 12 which is applicable to any or all of the above described structures.

In FIGS. 11 and 12, pads **78** are provided on the adjacent facing sides of the bridge connection boxes **79**. It is pointed out, however, that in the fitting of a mounting embodying the arrangement of FIGS. 11 and 12, the pads **78** are so spaced from each other by lateral or sidewise adjustment of the guard arms **82** as to cause said pads to very lightly engage the sides of a wearer's nose. The entire or major portion of the weight of the mounting **81**, however, is supported by the bridge **80** which bears downwardly against the forward or top less sensitive part of the nose. Again, the flexible bridge **80** will conform readily to the nose shape and provide a comfortable non-irritating support for the mounting and by the gentle and light contact made by the pads **78** any tendency for sidewise motion of the mounting is opposed.

Referring more particularly to FIG. 12, it will be seen that a preferred pad construction **78** embodies a metal part **83** secured to an adjustable pad supporting arm **84** which is, in turn, soldered or otherwise attached to the box **79**. The metal part **83** has plastic or other covering **85** thereon. The covering **85** may be applied by dipping the part **83** into a suitably liquid plastic material or the like which may thereafter be allowed to harden by polymerization or a laminating technique may be used. With the above construction, the flexible bridge **80** and the pads **78** may be adjusted independently of each other.

It is particularly pointed out that with any one of the above described constructions or others not shown which would fall within the scope of this invention, an adjustable self-conforming flexible saddle type bridge is provided to fit comfortably and securely over the forward or outer less sensitive surface of a person's nose and said bridge construction may be adjusted so that the entire or major portion of the weight of the spectacle will bear comfortably on said forward part of the nose and not against the more sensitive side parts of the nose. In addition, the present invention provides a flexible or pliable saddle type bridge structure which is readily adjustable relative to the lens supporting section of the mounting to provide for an accurate and comfortable fitting of the mounting on the wearer's face regardless of the particular nose shape or other adjacent facial contours. Furthermore, the bridge structures shown and described herein are applicable to all types of eyewear including industrial goggles, sun glasses, sports goggles, library spectacles or conventional spectacles of the various different shapes, sizes and designs. Also, the flexible bridge parts may be formed of clear and transparent or of flesh colored materials so as to be relatively inconspicuous or, if desired, they may be otherwise colored to produce different aesthetic effects.

From the foregoing, it will be seen that simple inexpensive and efficient means have been provided for accomplishing all of the objects and advantages of the invention as expressed in the accompanying claims and the invention is not to be limited to the exact matters shown and described as only the preferred matters have been given by way of illustration.

Having described my invention, I claim:

1. A bridge of relatively thin essentially non-elastic pliable material carried by a pair of relatively rigid arms for supporting a spectacle frame in a position of use upon the nose wherein the improvement comprises said bridge having an arched relatively wide intermediate nose engaging section and depending leg portions of considerably reduced substantially uniform width one at each of opposite sides of said intermediate section, a connection box fixed to one end of each of said arms, said connection boxes each having a slideway into which one of said leg portions is longitudinally slidably extended whereby the height of said intermediate section of said bridge relative to said supporting arms may be adjusted according to the extent to which said leg portions are moved into said connection boxes and said connection boxes incorporating releasable clamping means for fixedly securing said leg portions in preselected longitudinally adjusted positions therein.

2. In a spectacle frame having a pair of spaced lens retaining rims interconnected by a transversely extending relatively rigid bar arranged to be disposed forwardly of the upper region of the nose when said frame is in use and a bridge of relatively thin essentially non-elastic pliable material carried by free ends of a pair of relatively rigid arms extending from the nasal portion of said frame for supporting said frame in a position of use upon the nose, the improvement comprising said bridge having an arched relatively wide intermediate nose engaging section and depending leg portions of considerably reduced substantially uniform width one at each of opposite sides of said intermediate section, a connection box fixed to said free end of each arm, said connection boxes each having a slideway into which one of said leg portions is longitudinally slidably extended whereby the height of said intermediate section of said bridge relative to said supporting arms may be adjusted according to the extent to which said leg portions are moved into said connection boxes and said connection boxes incorporating releaseable clamping means for fixedly securing said leg portions in longitudinally adjusted positions therein preselected according to the height required of said intermediate

portion of said bridge above said arms for proper fitting of said frame upon said nose.

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