April 9, 1968 J. KACZOROWSKI 3,376,616

IN-LINE BUCKLE

Filed June 6, 1966

Fig. 2.

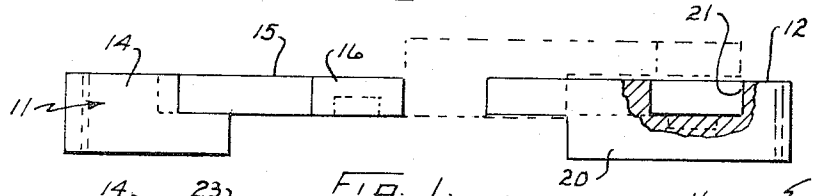


Fig. 1.

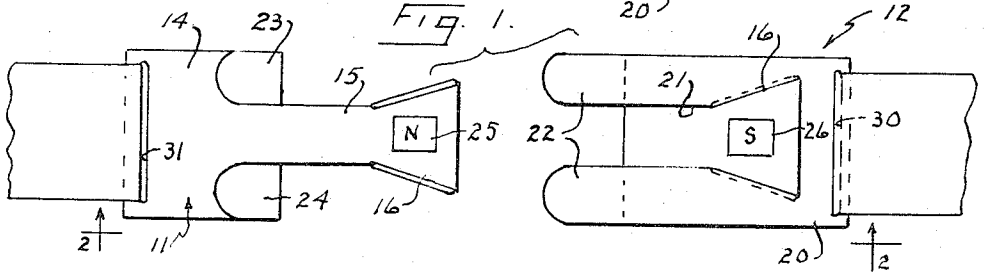


Fig. 3.

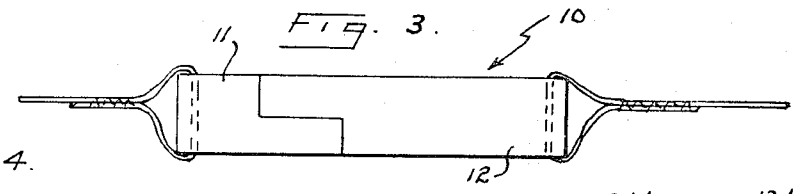


Fig. 4.

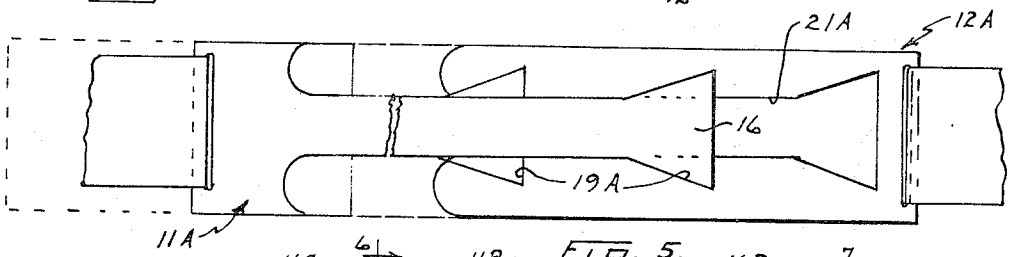


Fig. 5.

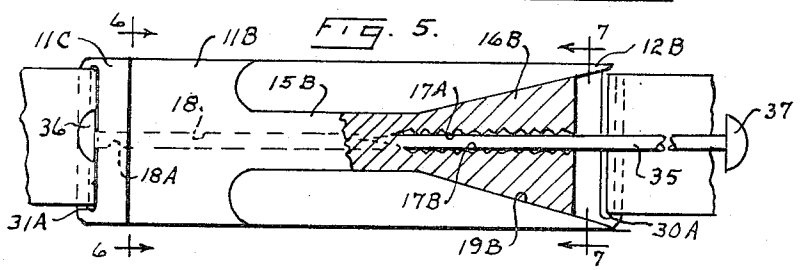


Fig. 6.

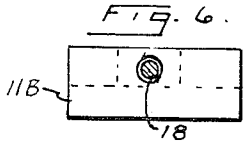
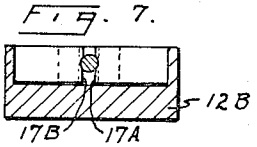


Fig. 7.



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IN-LINE BUCKLE

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ABSTRACT OF THE DISCLOSURE

An in-line belt buckle comprised of a pair of easily separable and easily connectable, substantially flat elements in which the elements are non-magnetic and in which one element is provided with one pole of a permanent magnet and the other element is provided with the opposite pole of a permanent magnet positioned to align with each other when the buckle elements are positioned in a closed relationship.

This invention relates to separable fastening elements and more particularly to a pair of fastening elements which, when affixed in their fastened relationship, are in a flat in-line position.

In the past buckles have been provided using a central movable tongue or prong and buckles have been provided to overlap and interlock, however it is an object of this invention to provide a buckle in which the central tongue or prong is fixed and in which the end of the tongue or prong fits into an interlocking relationship with the opposite element of the buckle to lock both elements in an in-line relationship.

It is a further object of this invention to provide two flat mating elements for a buckle in which one is provided with a male tongue or prong while the opposite element is provided with a socket to permit an interlocking relationship and in which a north and south pole pair of permanent magnets are provided one within the socket and the other affixed to the tongue or prong so that the two elements will be retained in their nested relation by the pair of permanent magnets.

Other objects of this invention may be apparent by reference to the accompanying detailed description and the drawings in which

FIG. 1 is an exploded plan view of the buckle,

FIG. 2 is a side elevational view taken on line 2—2 of FIG. 1,

FIG. 3 is a side elevational view of the buckle in an in-line nested relation,

FIG. 4 is a further embodiment in a plan view,

FIG. 5 is a still further embodiment in a plan view,

FIG. 6 is an end view taken on line 6—6 of FIG. 5, and

FIG. 7 is a cross sectional view taken on line 7—7 of FIG. 5.

Referring to FIG. 1 there is illustrated a male element **11** and mating female element **12** to provide a combined buckle **10** that may be used with any strap, belt, rope, etc. Both elements **11** and **12** of the buckle **10** are of the same thickness as shown in FIGS. 2 and 3 and when nested together as shown in FIG. 3 provide an in-line buckle. Element **11** is a one piece body with a solid base **14** and an extended tongue **15**. The outer end of tongue **15** is expanded in a wedge shape **16**. Tongue **15** is approximately one third the thickness of the body portion **14**. Element **12** is essentially a solid body **20** with a cutout portion **21** and wedge shaped socket **19**. Portion **21** and socket **19** are of a configuration to match the configuration of tongue **15** and its expanded end **16**. Body portion **20** is also provided with extended lips **22** of a thickness approximately half the thickness of body **20** so that when portion **20** and **14** are brought into an abutting

relationship, tongue **15** will fit into the cutout portion **21**. The elements **11** and **12** must be pressed together to seat tongue **15** in the cavity or socket or cutout portion **21**. Body **14** is also provided with a pair of shelf-like areas **23** and **24** to receive the extended lips **22** thus holding the bodies **14** and **20** in a nested in-line relationship. To assure the two elements **11** and **12** remaining in the nested relationship as shown in FIG. 3, the tooling of the tongue **15** and the cutout portion **21** must be to provide a good tight fit. However to prevent the possibility of the tongue **15** releasing from the cutout portion **21**, a pair of permanent magnets, a north pole **25** may be inserted in the portion **16** of tongue **15** and a south pole **26** may be inserted in the cutout portion **21** in alignment with the north pole magnet **25** when the buckle is in a closed nested relationship. The permanent magnets will tend to retain the two elements in their nested position preventing any attempt to separate due to vibration or distorting of the buckle. A still further method of insuring the retention of tongue **15** in socket or cutout portion **21** is to provide an adhering surface to the wedge element **16** and to the wedge shaped cutout area **21** so that when there is pull on the buckle to separate elements **11** and **12**, the tongue **15** will bind in the wedge shaped area **16** of the cutout portion **21** and will adhere along its surface to provide a tight binding securing means.

A still further improvement to the buckle is to provide the cutout portion **21** and specifically the wedge shaped area with an inwardly slanted edge while the tongue **15** and specifically the wedge shaped area **16** is shaped with an oppositely inclined wedge shape being somewhat wider on the bottom and narrower on the top so that the tongue **15** will wedge inward into a tight fitting relation that cannot release until the tongue **15** is forced inward to release the binding action of the end **16** within the cutout portion **21**.

Referring to FIG. 4 there is illustrated a further embodiment of the buckle or separable fastening elements. In this embodiment the two elements **11A** and **12A** are elongated slightly to accommodate the changes over the embodiment illustrated in FIGS. 1–3. Element **11A** is similarly formed with a body portion **14** and an elongated tongue **15**, however tongue **15** is of a length to permit adjustment in element **12A**. Element **12** is formed similar to element **12** of FIGS. 1–3, however, the cutout portion **21A** is provided with a plurality of enlarged wedge shaped areas **19A** in spaced relation. This permits setting tongue **15** in any of the adjusted positions, that is, the expanded end **16** of tongue **15** may be fitted into any of the areas or sockets **19A** to shorten or lengthen the belt or strap as the case may be.

A still further embodiment of this invention is illustrated in FIGS. 5, 6 and 7 in which the body elements **11B** and **12B** are somewhat similar to elements **11** and **12** of FIGS. 1–3, that is, they are shaped similar and they are pressed into mating in-line relationship. In this embodiment the tongue **15B** is provided with a central bore **18** and the expanded end **16B** is split into two jaws **17A** and B. The jaws have serrated or toothed faces to provide a gripping surface. In this embodiment the strap or belt is attached at one end to the buckle by a loop **30A** on element **12B**. However the other end of the strap or belt is attached to a separate block **11C** of a configuration to match the cross sectional area of element **11B**. Block **11C** is provided with a loop **31A** to permit attaching the belt or strap. Block **11C** is also provided with a central bore **18A** to match bore **18** of element **11B**. A nylon cord or rope **35** is passed through bore **18A** and bore **18**, the cord or rope is provided with knots or buttons **36** and **37** at either end to insure the retention of the nylon in the elements **11B** and **11C**. In use the nylon rope **35** may be pulled to its maximum position as illus-

trated in FIG. 5, thus element **11C** will abut with element **11B** and the jaws **17A** and **17B** will grip the nylon rope **35** while the expanded split end **16B** will be retained and wedged in socket **19B**. In the event the belt or strap is to be adjusted to stretch or increase its length, the knot or button **37** is pulled to release element **11B** from element **12B**. The cord or rope **35** is then pulled by button **36** to provide the degree of stretch desired. The elements **11B** and **12B** are pressed together and the pull on tongue **15B** provides a gripping of jaws **17A** and B on the extended position of the nylon rope **35** and holds the strap or belt in the adjusted position. The rope **35** may be of any desired length and the belt or strap attachment by buckle **10C** will be the same as in the previous embodiments.

The buckle may of course be made in metal, plastic, hard rubber or any hard finishable material according to the intended use and the buckle may be attached to a web or belt in any of the standard manners of attaching such as by providing a slot **30** in element **12** and a slot **31** in element **11** for passing the belt or webbing therethrough or sewing or affixing the belt together as is common practice. It is to be noted in FIGS. 1 and 2 that when magnets **25** and **26** are to be utilized, the elements **11** and **12** cannot be of metal due to the magnetic effect of the magnets as the metal would cancel the intended purpose of the magnets. However the magnets will work with every known non-conductive material utilized for a buckle. In the event the buckle is made of plastic, a friction coating may be utilized in the cutout portion **21** and on the under side and edges of tongue **15** thus insuring a positive grip.

The buckle as described may be very small and light for use such as for attaching a watch band to a watch thus providing a quick attachment or quick release for removing the watch or for repairing the watch. Likewise the buckle may be used for shoulder straps for ladies garments or the buckle may be slightly larger and be used with a strap for a safety belt or for embracing a small package or books for a child and the like or the buckle may be made in a highly decorative finish for belts for men or the buckle may be made quite heavy as a tow element for a tow rope, etc.

Although the buckle has been described with the general configuration illustrated, the tongue may be short or long as long as the matching cutout portions or sockets mate the configuration of the tongue. The mating elements of the buckle are designed to abut and be pressed into an in-line nested relationship. However the general configuration of the tongue and cutout portion may vary as long as the in-line relationship is maintained without departing from the spirit of this invention and this invention shall be lmited only by the appended claims.

What is claimed is:

1. An in-line buckle comprising a pair of relatively separable and connectible substantially flat and equally proportioned non-magnetic first and second buckle body elements with a permanent magnet, each having means to attach the opposite ends of a belt, said first buckle body element having an elongated tongue on the side opposite to said belt attachment, said second buckle body element having an elongated cutout portion on the side opposite to said belt attachment, said cutout portion matching the configuration of said tongue, said tongue being less than the thickness of said first buckle body element, said cutout portion being the same thickness as said tongue, said tongue provided with one pole of a permanent magnet and said cutout portion of said second body element provided with an opposite pole of said permanent magnet and positioned to be in alignment with said pole of said permanent magnet in said tongue when said tongue is in mating relationship with said cutout portion.

2. An in-line fastening buckle comprising a pair of relatively separable and connectible substantially flat and equally proportional first and second buckle body elements, each having a narrow slot therethrough at one end, each slot having a flexible belt passed therethrough and forming a loop for attaching the end to said belt to provide a positive attachment of said belt at each end to said first and second buckle body elements, said first buckle body element having an elongated tongue on the side opposite to said belt attachment, said second buckle body element having an elongated cutout portion on the side opposite to said belt attachment, said cutout portion matching the configuration of said tongue, said tongue being approximately one half the thickness of said first buckle body element, said cutout portion being approximately one half the depth of the second buckle body element, said buckle body elements composed of a non-magnetic material and in which said tongue of said first body element is provided with one pole of a permanent magnet and in which said cutout portion of said second body element is provided with an opposite pole of said permanent magnet and positioned to be in alignment with said permanent magnet in said tongue when said tongue is in mating relationship with said cutout portion.

References Cited

UNITED STATES PATENTS

2,346,887	4/1944	Winkler.
2,833,015	5/1958	Kreisler.
3,027,617	4/1962	Gray.
3,080,635	3/1963	Gunther.
3,141,216	7/1964	Brett.
3,293,714	12/1966	Shafer.

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