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(54) **DEVICE FOR HOLDING A BAG OR THE LIKE IN PLACE AND FOR DISTRIBUTING THE WEIGHT OF THE BAG UPON THE BODY DURING ACTIVE MOVEMENT**

VORRICHTUNG ZUM HALTEN EINER TASCHE IN RICHTIGE STELLUNG UND ZUM VERTEILEN DES GEWICHTES DER TASCHE AN DEN KÖRPER WÄHREND EINER SCHNELLEN BEWEGUNG

DISPOSITIF SERVANT A MAINTENIR UN SAC OU UN ARTICLE ANALOGUE EN POSITION, ET A REPARTIR LE POIDS DU SAC SUR LE CORPS AU COURS D'UN MOUVEMENT RAPIDE

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(73) Proprietor: **HATTO, Jaan**
114 79 Stockholm (SE)

(72) Inventor: **HATTO, Jaan**
114 79 Stockholm (SE)

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Description

BACKGROUND ART

When a person is running his body is moving continously up and down a weight carried in a bag affects the motion of the bag and thereby the body.

a) The body has completed its downward and start its upward movement from the lowest position;

$$F_{dn} = F_t + F_i - F_f = \quad (1)$$
$$= m\,(g+A_{up}) + m\,W^2_{dn}/2_s - F_f$$

b) The body starts to fall from the highest position;

$$F_{up} = -F_t + F_i - F_f = \quad (2)$$
$$= -\,m\,(g-A_{dn}) + m\,W^2_{up}/2_s - F_f$$

Where:

F_t = gravitational force
F_i = inertial force
F_f = frictional forces
A_{up} = acceleration of the body in upward movement
A_{dn} = acceleration of the body in downward movement
W_{up} = velocity of the weight in upward movement
W_{dn} = velocity of the weight in downward movement
m = mass of the weight
s = displacement, distance, there inertial forces act to stop the downward or upward movement of the weight and to direct it downward or upward again.

The document USA 4,878,606 presents a device comprising a waist belt, a shoulder strap, an adjustable underarm strap. A bag is supported by waist belt by means of a multiple belt loop system adjacent the user's hip.

The human body is continuosly moving. A bag has to follow the complecated movement of the body. The presented device does not provide appropriate directed elasticity to hold a bag and its contents securely in place with a minimum impact to the body during the complicated movements. In the case the bag is fixed too tight or too loose to the body of user it creates discomfort and even injury by long time use with heavier loads.

The presented device has a diagonnally crossing shoulder strap and underarm strap to hold the shoulder strap in its proper place, which is a result of lacking elasticity. The tight waist belt does not allow to distribute weight automatically and accordingly to movements.The shoulder strap is attached to the ends of the bag.

In ordinary devices the weight of a load is not fixed in its position inside of bag and will move with a greater velocity than the bag. Thus F_i consists of two components, i.e. the mass and velocity of the weight contributing the inertial force When these forces become sufficiently strong the weight and the bag begin to move relative to the body. When displacement s becomes sufficiently great the weight creates a discord relative to the motion of the body.

In this way the weight and the bag fall out of the step with the motion of the body which the carrier experiences as an unpleasent bouncing movement. Displacement s becomes even greater.

If it is necessary to carry paper or documents in format up to A4, to move around freely and to have hands free while having a breast pocket available at the same time, there are at present no known device which permit to insert or take out materials without taking off first a bag. The invention as claimed provides a solution to this problem.

The purpose of the invention is to keep the displacement s at a so low level that it does not disturb a carrier The invention is directed to a device which comprises an elastic waist belt (D), a shoulder strap (A) and a bag or holder (E). The shoulder strap (A) is attached to the elastic waist belt (D) by an adjustable fastening (B), which is adjustable along the elastic waist belt (D). The upper end of the bag or the holder (E) is attached to the shoulder strap (A) and the lower part of the bag is formed adjustable on the elastic waist belt (D) by means of an adjustable fastening (F), which slides along the elastic waist belt (D). The bag or holder may be detached from the shoulder strap (A). The elastic waist belt (D) has different elasticities on the front and rear side and least one buckle (C,G).

Equations (1) and (2) show that the lower the level of displacement s the greater forces are acting upon the device and thereby the body of a carrier. With the device of the invention the weight is pressed tightly against the body and thereby reducing the moment of the weight upon the carrier's shoulder and subsequently increasing the friction. This together with the elasticity of the of the belts, holds bag and its contents stationary. The counteractive force of the elasticity is proportional to displacement s.

The forces F_{up} and F_{dn} act on a relatively limited area of the body.When a person runs or jumps the body begins to fall with an acceleration g,whereby a=g .Thus F_t =0 and weight strikes the bag and thereby the body upward with the inertial force F_i. Equations (1) and (2) show that F_{dn} is always greater than F_{up}.

Accordingly a harder fastening is needed when the body moves upward; than the body starts to fall. Usually a weight is bound equally in the both cases or a bag is

hanging on the belt (D).

The elastic waist belt (D) which enables a dampening effect downward together with the friction of the shoulder strap (A) counteract the force F_{dn} on the both sides of the body. When the body starts to fall the elastic waist belt (D) acts only under the bag. In this way the same effect is achieved with less pressure and a lighter fastening to the body.

When the weight of the load is increased or the carrier begins to run instead of to walk, the equlibrium between forces F_{dn} F_{up} and forces fixing the bag become disrupted. With the bags ordinarily in use it would be necessary to take a bag off and open buckles to adjust the length of the belt or strap in order to fasten the bag more securely to the body or the weight and bag will be hold with hands which are not free in this case.

The invention has adjustable fastenings (B) and (F) which are adjustable along the elastic waist belt (D). It is not necessary to open any buckle or take off the bag to adjust the belt or strap. This is carried out simply by drawing the elastic waist belt (D) through the freely sliding fastening (F) and press the elastic waist belt (D) downward simultaneously (Fig.3.). The length of the elastic waist belt (D) and shoulder strap (A) is made adjustable for more ajdustment.

If a carrier suddenly falls or jumps a device will be exposed to considerably stronger forces. In this case the durability of the construction is put to a serious test. The invention effectively reduces an impact of heavier blows due to the elasticity of the elastic waist belt or belts (D). The bag or holder (E) is attached to upper end of the front side, which enables to fix the weight inside of the bag partly or entirely (Fig..2.) In a second embodiment of the invention two bags are connected to the elastic belt (D) comprising of two elastic waist belts sliding freely against one another (Fig.4.) and in a third embodiment the bags are jointed into one.

(Fig.5.) enabling the distribution the increasing pressure of the bag upon the waist belt and the shoulder strap and thereby on the body.

Claims

1. A device comprising a bag or holder (E) designed to hold its contents securely in place during active movement, to distribute the weight of the bag or holder upon the body, and to effectively dampen heavier impacts, the device comprising a waist belt (D) a shoulder strap (A) at least one buckle (C,G), and first fastening (F) to adjust the lower part of the bag or holder (E) along the waist belt (D), the bag or holder (E) being attached to shoulder strap (A) by its upper end, the length of the belt and strap being adjustable,
   characterised in that,
   the belt (D) is elastic, the shoulder strap (A) is attached to the waist belt (D) by a second fastening (B), which is adjustable on the waist belt (D).

2. Device according to claim 1,
   characterised in that
   the bag (E) is detachably mounted on the strap (A).

3. Device according to claims 1 and 2,
   characterised in that,
   the bag (E) is movable along, the strap (A).

4. Device according to any of the above claims,
   characterised in that,
   the bag (E) is attached at its upper end of the front and its lower part of the rear side. (Fig.2.).

5. Device acording to any of the above claims,
   characterised in that,
   the belt (D) has different elasticities on the front and rear sides.

6. Device according to any of the above claims,
   characterised in that,
   the bag (E) is designed as a paper holder.

7. Two devices according to claims 1,2,3,4 and 5,
   characterised in that,
   they are assembled as a single unit, the elastic belt (D) being comprised of two said elastic belts which slide freely against one another, both bags sliding freely along the elastic belt (Fig.4.).

8. Device according to claim 7 for use as a haversack
   characterised in that,
   bags are assembled as a single unit, associated with two said shoulder straps and two said waist belts sliding freely against one another. (Fig.5.).

Patentansprüche

1. Die Vorrichtung dient dazu, bei einer aktiven Bewegung die Tasche und deren Inhalt unbeweglich zu lassen, das Gewicht der Tasche am Körper ausgleichen sowie kräftige Schläge zu dämpfen. Die Vorrichtung besteht aus einem Gurt (D), einem Schulterriemen (A), mindestens einer Schnalle (C,G) und erste Bindung (F) dient dazu, der Unterteil der Tasche oder Halfter (E) auf dem Gurt (D) justieren. Die Länge des Gurtes (D) und Schulterriemens (A) ist justierbar.
   ist davon gekennzeichnet
   daß der Gurt (E) elastisch, der Schulterriemen (A) wird an dem Gurt (D) mit Hilfe anderer Bindung (B) befestigt, die Bindung (B) ist justierbar auf dem Gurt (D) und das obere Ende der Tasche oder Halfter (E) wird an dem Schulterriemen (A) befestigt Bild 1.

2. Die Vorrichtung gemäß Anforderungen 1
   ist davon gekennzeichnet
   daß die Tasche (E) wird an dem Gurt (A) trennbar

befestigt.

3. Die Vorrichtung gemäß Anforderungen 1,2,
ist davon gekennzeichnet
daß die Tache (E) auf dem Gurt (A) beweglich ist.

4. Die Vorrichtung gemäß einer der obigen Anforderungen
ist davon gekennzeichnet
daß die Tasche (E) an die Oberkante der Vorderseite und die Unterkante der Rückseite befestigt wird. Bild 2.

5. Die Vorrichtung gemäß einer der obigen Anforderungen
ist davon gekennzeichnet
daß die Vorder- und Rückseite des Gurtes verschiedene Elastizität haben.

6. Die Vorrichtung gemäß einer der obigen Anforderungen
ist davon gekennzeichnet
daß die Tasche (E) wie eine Papiermappe ausgeführt ist.

7. Zwei Vorrichtungen gemäß der Anforderungen 1,2,3,4 und 5
sind davon gekennzeichnet,
daß die einer Einheit zusammengesetzt werden. Der elastische Gurt (D) besteht aus zwei elastischen Gurten, die frei gegeneinander laufen und beide Taschen sind auf dem elastischen Gurt voll beweglich. Bild 4.

8. Die Vorrichtung gemäß der Anforderung 7
ist davon gekennzeichnet
daß die Taschen zu einer Einheit zusammengesetzt werden, die zwei Schulterriemen und Gurte angeschlossen werden, damit die Gurte frei gegeneinander laufen. Bild 5.

Revendications

1. Un dispositif comprenant un sac ou étui (E) conçu pour que son contenu soit maintenu en place en sécurité lors de mouvements actifs, pour répartir le poids du sac ou de l'étui sur le corps et amortir efficacement le chocs les plus durs, le dispositif comprenant une ceinture pour la taille (D), une courroie passant sur l'épaule, une boucle au moins (C,G),et une première attache (F) pour ajuster la partie inférieure du sac ou l'étui (E) sur la ceinture (D). La ceinture (D) sa longueur et celle de la courroie etant ajustables
caractérisé par le fait que
la ceinture (D) est élastique, la courroie est attachée à la ceinture (D) par une seconde attache (B) ajustable sur le ceinture (D), le sac ou étui (E) étant attaché à la courroie (A) par son extrémité supérieure.

2. Le dispositif selon le revendication 1 est
caractérisé par le fait que
le sac (E) est détachable de la courroie (A) sur laquelle il est monté.

3. Le dispositif selon les revendications 1 et 2 est
caractérisé par le fait que
le sac (E) est mobile le long de la courroie (A)

4. Le dispositif selon toute revendication ci-dessus mentionée est
caractérisé par le fait que
le sac (E) est attaché à l'extrémité supérieure de l'avant et à la partie inférieure du côté arrière (Fig 2)

5. Le despositif selon toute revendication ci-dessus mentionnée est
caractérisé par le fait que
la ceinture (D) a différentes élasticités sur les côtés avant et arrière.

6. Le despositif selon toute revendications ci-dessus mentionnée est
caractérisé par le fait que
le sac (E) est conçu comme étui porte -document.

7. Deux dispositifs selon les revendications 1,2,3,4 et 5 sont
caractérisés par le fait que
ils sont assemblés en une simple unité, le ceinture élastique (D) comprenant les deux ceintures élastiques mentionnées glissant librement l'une contre autre, les deux sacs glissant librement le long de la ceinture élastique (Fig 4).

8. Le dispositif selon le revendication 7 pour être utlisé sac à dos est
caractérisé par le fait que
les sacs sont assemblés en une simple unité, associée avec les deux courroies sur l'épaule et les deux ceintures mentionnées, glissant librement l'une contre l'autre (Fig.5).

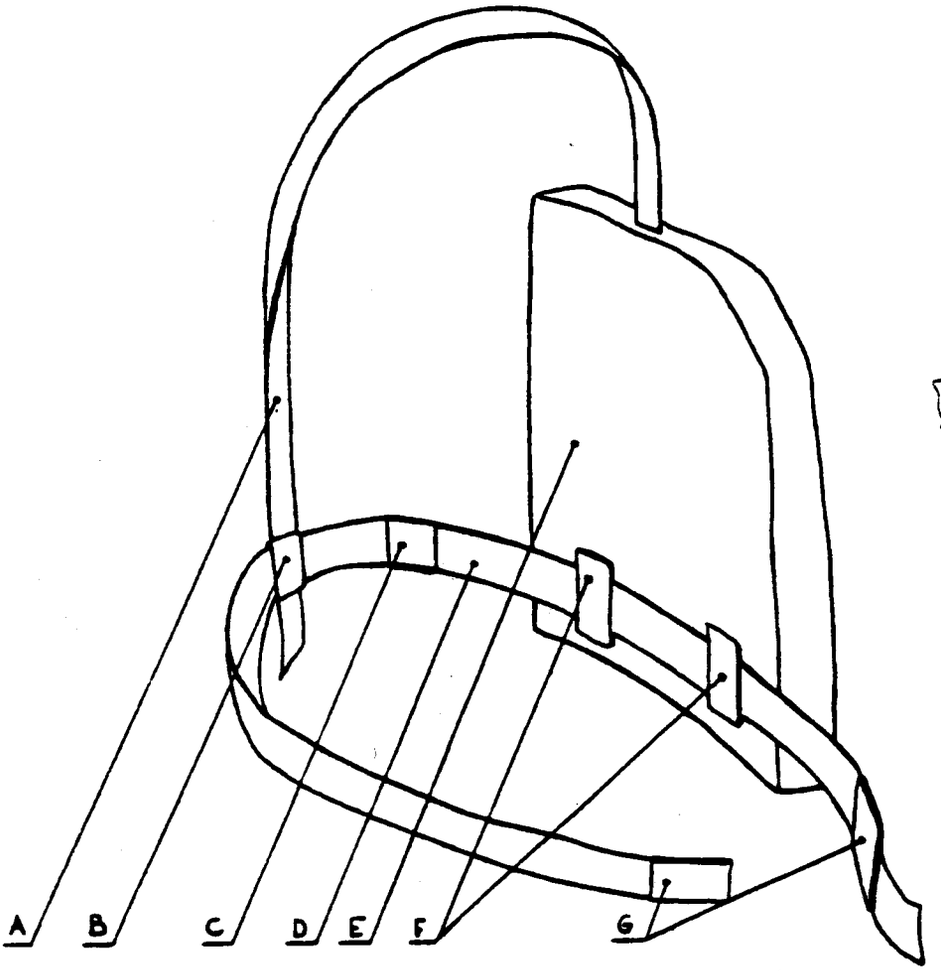


Fig.1

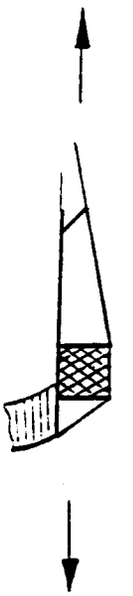


Fig.2

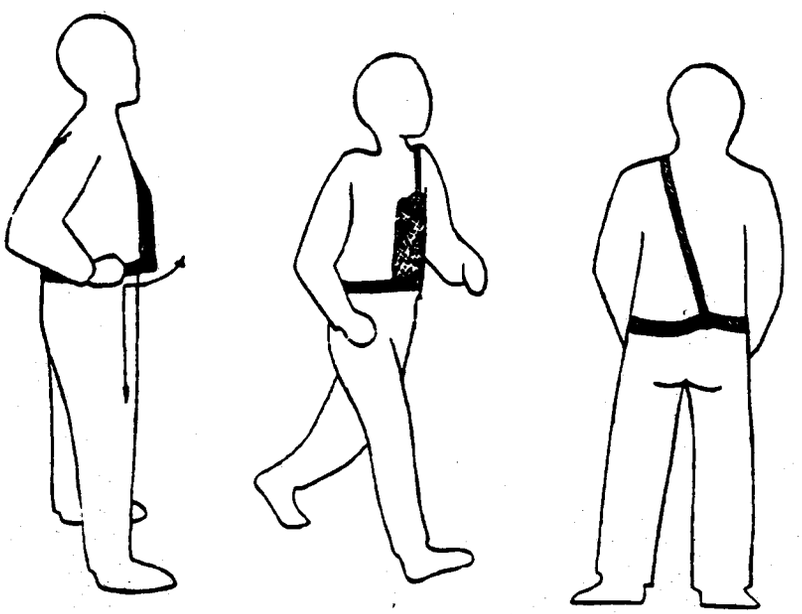


Fig.3.

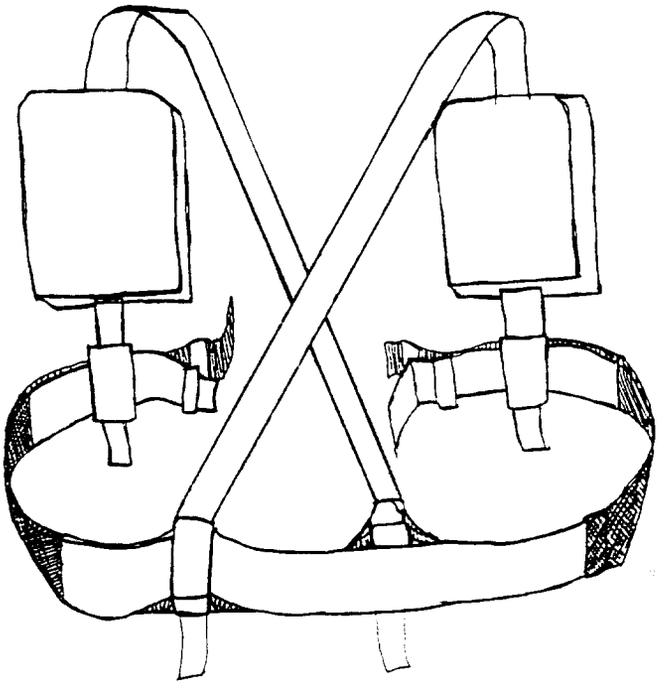


Fig.4.

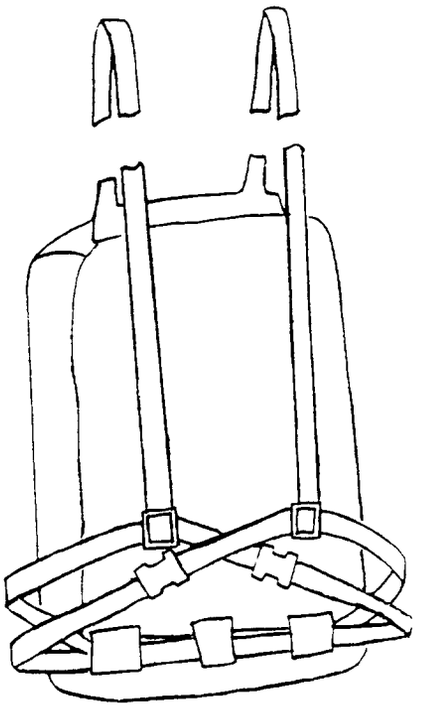


Fig.5.