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⑦① Applicant: **Barcaroli, Leonardo, Piazza dei Sanniti 42, I-00185 Roma (IT)**

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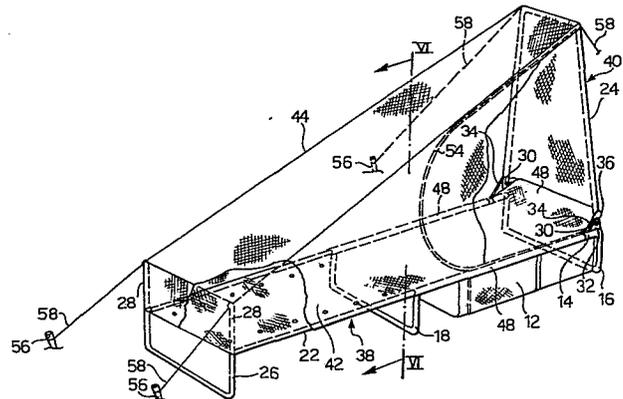
⑦② Inventor: **Barcaroli, Leonardo, Piazza dei Sanniti 42, I-00185 Roma (IT)**

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⑦④ Representative: **Jacobacci, Filippo et al, c/o Jacobacci-CASETTA & PERANI S.p.A. Via Alfieri 17, I-10121 Torino (IT)**

⑤④ **Rucksack with a rigid supporting frame.**

⑤⑦ A rucksack (10) comprises a flexible sack (12) and a rigid support frame (14) for the sack (12) which forms part of an extensible structure (20) which can assume a contracted, carrying state and an extended state of use in which it forms a camp-bed framework (38) and a tent support (40). Sheets (42, 44) are attached to the extensible structure (20) and cooperate with the camp-bed framework (38) and with the tent support (40) to complete a camp bed and to form a tent which covers the bed.



"Rucksack with a rigid supporting frame"

The present invention relates to rucksacks comprising a flexible sack and a rigid support frame for the sack.

Rucksacks of this type are particularly convenient and practical, provide a large load volume and are  
5 more convenient to carry than conventional rucksacks which are not provided with rigid support frames. These rucksacks are hence particularly suitable for use by hikers, mountaineers and even the military.

For uses of this type it is generally necessary for  
10 the user to be provided with camping equipment for taking shelter and rest during stops in the open, this usually comprising a camping tent composed of support poles and a flexible cover, a mattress or the like for placing on the floor of the tent to isolate the user's  
15 body from the earth, and possibly a sleeping bag. This equipment is clearly bulky, heavy and difficult to arrange in the rucksack. Moreover, it is extremely inconvenient to use, particularly as regards the assembly and dismantling of the various components of the tent,  
20 which generally require long and tedious operations.

The object of the present invention is to avoid these disadvantages and this object is achieved by virtue of the fact that a rucksack of the type defined at the beginning is characterised in that the support  
25 frame forms part of an extensible structure which can assume a contracted, carrying state and an extended state of use, the said extensible structure being arranged, in its extended state of use, to form a camp-bed framework and a tent support, and in that sheets  
30 are associated with the extensible structure for cooperating with the camp-bed framework and with the tent support to complete a camp-bed and to form a tent which covers the said bed.

By virtue of this characteristic, the rucksack  
35 according to the invention enables the use of conventional, bulky and complicated camping equipment to be avoided

and is able to provide the user with a convenient and practical shelter without altering the carrying capacity of the flexible sack. Since the extensible structure makes use of the support frame of the sack, it may be formed from a smaller number of components, with the advantage of being particularly light and easy and economical to manufacture.

Furthermore, as will become clear from the following description of several preferred embodiments, the extensible structure can be transformed from the contracted, carrying state to the extended state of use and vice versa particularly rapidly and easily. The presence of the camp-bed, which constitutes the bottom of the tent, on the other hand, enables the use of mattresses or the like to isolate the user's body from the earth to be avoided while, at the same time, offering greater comfort than conventional tents.

According to the invention, in its contracted, carrying state, the extensible structure is assembled in the dorsal region of the rucksack and is substantially contained within the bulk of the support frame.

Thus the extensible structure does not alter the carrying convenience, nor the bulk, of the rucksack in any way.

In general, the extensible structure of the rucksack includes, in addition to the support frame for the flexible sack, which may constitute part of the camp-bed framework or alternatively the tent support, two complementary elements of which one may constitute the tent support or alternatively a portion of the camp-bed framework, and the other completes the camp-bed framework.

Depending on the method of connection of the support frame to the two complementary elements, the extensible structure may be of a telescopic or foldable type or partly telescopic and partly foldable.

Naturally, the extensible structure includes a plurality of ground-bearing members for the camp bed and for the tent

support which form part of, or are permanently connected to, the support frame and to one and/or the other complementary element.

In order to improve the habitability of the tent,  
5 the extensible structure may further include a smaller, supplementary, tent support located at that end of the camp-bed framework opposite the said tent support.

The sheets associated with the extensible structure suitably comprise a camp-bed sheet attached permanently  
10 to at least part of the camp-bed framework and a tent sheet connected permanently to the peripheral edge of the camp-bed sheet and provided with an access opening with closure means, preferably constituted by a sliding-clasp fastener.

15 Further characteristics and advantages of the invention will become clear in the course of the detailed description which follows with reference to the appended drawings, provided purely by way of non-limiting example, in which:

20 Figure 1 is a rear perspective view of a rucksack according to the invention with the extensible structure in the contracted, carrying state,

Figure 2 is a front perspective view of Figure 1,

Figure 3 is a perspective view of the rucksack with  
25 the extensible structure in its extended state of use,

Figure 4 is a perspective view, on an enlarged scale, of a detail of Figure 3,

Figure 5 is a perspective view of part of Figure 3,

Figure 6 is a transverse sectional view taken on  
30 line VI-VI of Figure 3,

Figure 7 is a schematic, side-elevational view of a first variant of the rucksack, with the extensible structure in the contracted, carrying state,

Figure 8 is a view similar to Figure 7 with the  
35 extensible structure in the extended state of use,

Figure 9 is a view similar to Figure 7 which illustrates a second variant of the rucksack with the extensible

structure in the contracted, carrying state, and

Figure 10 is a view similar to Figure 9 with the extensible structure in the extended state of use.

Referring initially to Figures 1 and 2, a rucksack  
5 generally indicated 10 is formed from a flexible sack 12, preferably of waterproofed material, and a support frame 14 to which the sack 12 is fastened by conventional retaining members not shown in the drawings.

The support frame 14 is generally rectangular in  
10 shape with a length greater than the height of the flexible sack 12, and is provided at its ends with two parts indicated 16 and 18 respectively, bent at 90°. In the carrying state of the rucksack 10, illustrated in Figures 1 and 2, the parts 16 and 18  
15 respectively define an upper bracket which extends above the top of the flexible sack 12, to which a sheet, not shown, may be attached to cover the sack itself, and a lower bracket which may be used to support any objects for which there is no room within the sack 12, for  
20 example a sleeping bag or other item.

The support frame 14 forms part of an extensible structure generally indicated 20 which, in the carrying state of Figures 1 and 2, is arranged in a contracted condition in the dorsal region of the rucksack 10 and is  
25 substantially entirely contained within the bulk of the support frame 14. This extensible structure 20 comprises, in addition to the support frame 14, two complementary elements, also in the form of frames, indicated respectively by 22 and 24. These two elements  
30 22 and 24, like the support frame 14, are preferably formed from circular-section tubular parts, preferably of metal, for example a light alloy, or of a high-strength plastics material.

As is clearly seen in Figure 3, the first complementary  
35 element 22 has substantially the same length as the support frame 14 and one end thereof is slidable telescopically within the support frame 14, from that

end corresponding to the bent end 18 thereof, between an inserted, carrying position, illustrated in Figures 1 and 2, and a withdrawn position of use, illustrated in Figure 3. Retaining members, not illustrated, 5 constituted for example by spring-loaded stop pins, are provided for locking the element 22 in one or other position relative to the frame 14.

The complementary element 22, at its end opposite the support frame 14, has a part 26 bent at  $90^{\circ}$ , which 10 is disposed like the end parts 16 and 18 of the support frame 14 and has dimensions corresponding to the dimensions thereof, and which is prolonged on the opposite side to form two shorter support rods 28, the function of which will be clarified below.

15 In the inserted position of the element 22, corresponding to the carrying state of the rucksack 10 of Figures 1 and 2, the bent end 26 with its rods 28 is disposed immediately below the used part 18 of the support frame 14, defining a stable base for resting the rucksack 20 10 on the ground.

The second complementary element 24 is articulated to one end of the support frame 14 close to the bent part 16 of the latter, that is at the opposite end from the first complementary element 22. Figure 4 illustrates 25 a detail of this articulation which is formed by means of a pair of transverse pins 30 carried by corresponding lugs 32 fixed to the support frame 14. The element 24 can be displaced angularly between the lowered, carrying state illustrated in Figures 1 and 2, in which it is 30 folded against the support frame 14, and a raised position of use, illustrated in Figure 3, in which it projects substantially perpendicular to the support frame 14 on the opposite side from the sack 12. As illustrated in detail in Figure 4, two toggle retaining devices 35 34 are attached to the frame 14 in the zone of articulation of the element 24 for retaining the element 24 firmly in the open position of use. Close to this

zone of articulation, the element 24 also has an attachment cross member 36 the function of which will be clarified below.

The transformation of the extensible structure 20 from the contracted, carrying state of Figures 1 and 2 to the extended state of use illustrated in Figure 3 may be effected extremely rapidly and easily by first placing the support frame 14 in a horizontal position, with the ends 16 and 18 resting on the ground and the flexible sack 12 facing downwardly, and subsequently extending the first complementary element 22 to its withdrawn position and the second complementary element 24 to its raised position. In this condition, the support frame 14 and the first complementary element 22 define a camp-bed framework 38, the ground-bearing members whereof are constituted by the bent parts 16, 18 and 26, while the second complementary element 24 defines a tent support 40.

The rucksack 10 is furnished with one or more sheets which cooperate with the camp-bed framework 38 and with the tent support 40 respectively to complete a camp-bed and to form a tent which covers the camp bed. In the example illustrated, these sheets comprise a camp-bed sheet 42, preferably but not necessarily of elasticised fabric, and a tent sheet 44 of waterproofed fabric. As illustrated in detail in Figures 5 and 6, the camp-bed sheet 42 comprises a first part 46 provided with peripheral, tubular parts 48 in which the longitudinal tubes of the support frame 14 and the attachment cross member 36 of the second complementary element 24 are permanently inserted, and a second part 50 provided with rapidly-attachable lateral parts 52, for example provided with snap fasteners, for releasably connecting it to the longitudinal tubes of the first complementary element 22.

The tent sheet 44 is formed into a prismatic-shaped cover with a substantially trapezoidal cross-section,

the edge whereof is fastened permanently, for example by sewing, to the peripheral edge of the camp-bed sheet 42. The front end, that is the higher end, of the sheet 44 is maintained under tension by the tent support 24, and the rear end, that is the lower end, is tensioned by means of two support poles 28. Furthermore, one of the side walls of the tent sheet 44 is provided with an access opening having a closure member constituted, in the example illustrated, by a sliding-clasp fastener 54. In order to ensure that the tent is sufficiently stable, ordinary tent pegs 56 are used, these being knocked into the ground and connected by means of respective guy ropes 58 at the tops of the second complementary element 24 and the two support poles 28 respectively, to the tent sheet 44.

Thus, a comfortable, commodious, tent is formed which does not require the use of mattresses to isolate the user's body from the ground since its base is constituted by the camp-bed formed by the framework 38 and the sheet 42. Thanks to the transverse attachment member 36, the front end of this camp-bed is slightly raised so as to form a convenient rest of the user's head without the need to make use of a cushion.

The transformation from the state of use of Figure 3 to the carrying state of Figures 1 and 2 may be effected equally simply and rapidly, after the pegs 56 have been removed, by first releasing the part 50 of the camp-bed sheet 42 from the second complementary element 22 and lowering the second complementary element 24 so as to release the tent sheet 44 to allow it to be folded and then reinserting the first complementary element 22. Thus the extensible structure 20 is reassembled in the dorsal region of the rucksack 10 with the sheets 42 and 44 folded between the flexible sack 12 and the second complementary element 24. The whole may be held in a pack by means of a pair of flexible, transverse straps

or belts 60, releasably connected to the support frame 14, which act as backrest members for the rucksack 10 during transport. Two shoulder, carrying straps 62, preferably of padded material, which may be connected permanently or releasably to the ends of the extensible structure 20 are naturally also provided. In the example illustrated, the shoulder straps 62 are fastened at their upper ends to the straps 60 and at their lower ends to the support frame 14 (Figure 1).

10 Figures 7 and 8 and 9 and 10 illustrate schematically first and second variants respectively of the extensible structure 20 of the rucksack 10. These variants are generally similar to the embodiments described above with reference to Figures 1 to 6, and only the differences 15 will be described in detail, the same reference numerals being used for identical or similar parts.

According to the variant of Figures 7 and 8, the support frame 14 carrying the flexible sack 12 has, at its upper end, a part 64 bent at  $90^{\circ}$  on the opposite 20 side from the sack 12, and at its lower end, a part 66 bent at an angle of about  $45^{\circ}$  on the same side as the sack 12. In this case the extensible structure 20 includes a first complementary element 68 articulated at one end at 70 to the support frame 14 close to the bent 25 part 66 and a second complementary element 72 exactly the same as the first complementary element 22 of the preceding embodiment and articulated at 74 to the free end of the first element 68. To the connecting part 74 between the two elements 68 and 72 is also articulated 30 a U-shaped tubular element 76.

In the contracted, carrying condition of the extensible structure 20, illustrated in Figure 7, the elements 68 and 72 are folded against the support frame 14 in the dorsal region of the rucksack 10, that is on the opposite 35 side from the flexible sack 12, and the sheets 42 and 44, which, for conciseness, have been omitted from this Figure, are assembled within the extensible structure 20.

The transformation from the contracted, carrying condition to the extended condition of use of Figure 8 is effected by holding the support frame 14 in a vertical position and placing the two elements 68 and 72 in  
5 horizontal positions, the one as an elongation of the other. Thus the two elements 68 and 72 define the camp-bed framework 38 which rests on the ground by means of the parts 66, 76 and 26, while the support frame 14 defines the tent support 40.

10 The sheets 42 and 44 are fastened respectively to the camp-bed framework 38 and the tent support 40 and to the two support poles 28 in a manner similar to that described above so as to complete the camp bed and form the tent covering the latter.

15 This variant is more convenient in certain ways than the embodiment described above and may thus be considered as a preferred embodiment of the invention. Indeed, in this case, in the extended condition of use of the extensible structure 20, the flexible sack 12  
20 is disposed vertically in front of the tent instead of beneath it and is hence more conveniently accessible to the user.

Furthermore, since the camp-bed framework 38 is formed solely from foldable parts, the entire camp-bed sheet  
25 42 may be connected to it permanently, rendering the transformation of the structure 20 from the contracted, carrying condition to the extended condition of use and vice versa even more simple and rapid.

The variant illustrated in Figures 9 and 10 is similar  
30 in shape and general disposition to the embodiment described with reference to Figures 1 and 6, and differs therefrom only in that the complementary element 22, instead of being telescopically slidable in the support frame 14, is articulated thereto at 78, close to the  
35 bent end part 16. In the assembled, carrying state of the extensible structure 20 illustrated in Figure 9, the complementary element 22 is thus folded against the

support frame 14 and the second complementary element 24 is interposed between these.

In the extended state of use of Figure 10, the support frame 14 and the complementary element 22 define the camp-bed framework 38 to which the camp-bed sheet 42 is fixed, while the second complementary element 24 defines the tent support 40 which, together with the support poles 28, anchors the tent sheet. In this case the sack 12 is again disposed between the support frame 14 and the ground.

From the above description it is clear that the rucksack according to the invention has a high degree of flexibility and practicality in use which is achieved with a small number of light components which are simple and economical to manufacture and arranged to make the rucksack even easier to carry. For these reasons the rucksack according to the invention is particularly advantageous in all cases in which the user foresees stops in the open, that is, for rambling and mountaineering uses, and even for normal or emergency use or for military uses.

Although the invention has been described with reference to the specific examples of practical embodiments, it is clear that it is possible to provide numerous variants, in particular with regard to the disposition, conformation and the number of components of the extensible structure of the rucksack, without thereby departing from the spirit of the present invention as defined by the following claims.

CLAIMS

1. Rucksack comprising a flexible sack and a rigid support frame for the sack, characterised in that the support frame (14) is part of an extensible structure (20) which can assume a contracted, carrying  
5 state and an extended state of use, the said extensible structure (20) being arranged, in its state of use, to form a camp-bed framework (38) and a tent support (40), and in that sheets (42,44) associated with the said extensible structure (20)  
10 cooperate with the camp-bed framework (38) and with the tent support (40) to complete a camp bed and to form a tent which covers the camp-bed.
2. Rucksack according to Claim 1, characterised in that  
15 the extensible structure (20), in the contracted, carrying state, is assembled in the dorsal region of the rucksack (10) and is contained substantially within the bulk of the support frame (14).
- 20 3. Rucksack according to Claim 1 or Claim 2, characterised in that the support frame (14), in the extended state of use of the extensible structure (20), defines a portion of the camp-bed framework (38) and in that the said extensible structure (20) includes  
25 two complementary elements (22,24) of which the first (22) is arranged to provide an elongation of the support frame (14) to complete the camp-bed framework (38) and the second (24) is arranged to extend transverse this latter to form the tent support (40).
- 30 4. Rucksack according to Claim 3, characterised in that the first complementary element (22) of the extensible structure (20) is telescopically slidable at one end of the support frame (14) between an inserted, carrying  
35 position and a withdrawn position of use.

5. Rucksack according to Claim 3, characterised  
in that the first complementary element (22) of the  
extensible structure (20) is articulated to one end  
of the support frame (14) so as to be rotatable  
5 relative to the latter between a collapsed carrying  
position and an extended position of use.

6. Rucksack according to Claim 4 or Claim 5,  
characterised in that the second complementary  
10 element (24) of the extensible structure (20) is  
articulated to that end of the support frame (14)  
opposite the first complementary element (22) so  
as to be rotatable relative to the support frame  
(14) between a lowered, carrying position and a raised  
15 position of use, and in that positioning means (34)  
are provided for retaining the said second  
complementary element (24) in the raised position.

7. Rucksack according to Claim 1 or Claim 2,  
20 characterised in that the support frame (14), in the  
extended state of use of the extensible structure  
(20), defines the said tent support (40), and in that  
the extensible structure (20) comprises first and second  
complementary elements (68,72) of which one is adapted  
25 to form an elongation of the other, transverse the support  
frame (14) to define the camp-bed framework (38).

8. Rucksack according to Claim 7, characterised in  
that the first and second complementary elements  
30 (68,72) of the extensible structure (20) are articulated  
respectively to one end of the support frame (14) and  
to that end of the first complementary element (68)  
opposite the said support frame (14) so as to be  
rotatable between a collapsed, carrying position  
35 and an extended position of use in which the support  
frame (14) projects upwardly relative to the  
camp-bed framework (38), positioning means (34,66)  
being provided for retaining the support frame (14)  
in this position.

9. Rucksack according to Claim 3 or Claim 7, characterised in that the extensible structure (20) further includes a plurality of ground-rest members (16,18,26;66,76,26) for the camp-bed framework (38) and the tent support (40), the said rest members forming part of, or being permanently connected to, the support frame (14) and to the first and/or second complementary element (22,24;68,72) respectively.

10 10. Rucksack according to Claim 9, characterised in that the extensible structure (20) further comprises a supplementary tent support (28,28) forming part of, or being connected permanently to, the said first (22) or second (72) complementary element respectively and projecting upwardly, in the extended state of use of the extensible structure (20), from that end of the camp-bed framework (38) opposite the said tent support (40).

20 11. Rucksack according to one or more of the preceding claims, characterised in that the said sheets comprise a camp-bed sheet (42) permanently connected at least in part (46) to the camp-bed framework (38) and a tent sheet (44) connected permanently to the peripheral edges of the camp-bed sheet (42) and provided with an access opening having closure means preferably constituted by a sliding-clasp fastener (54).

30 12. Rucksack according to Claim 11, characterised in that a part (50), if any, of the tent sheet (42) which is not connected permanently to the camp-bed framework (38) is provided with rapid attachment means (52) for its releasable connection to the camp-bed framework (38).

35 13. Rucksack according to Claim 11 or Claim 12, characterised in that the extensible structure (20) further includes an auxiliary attachment part (36) for the camp-bed sheet (42) which forms part of, or is

connected permanently to, the said tent support (40) and is disposed, in the extended state of use of the extensible structure (20), in a slightly higher position than the corresponding end of the camp-bed  
5 framework (38).

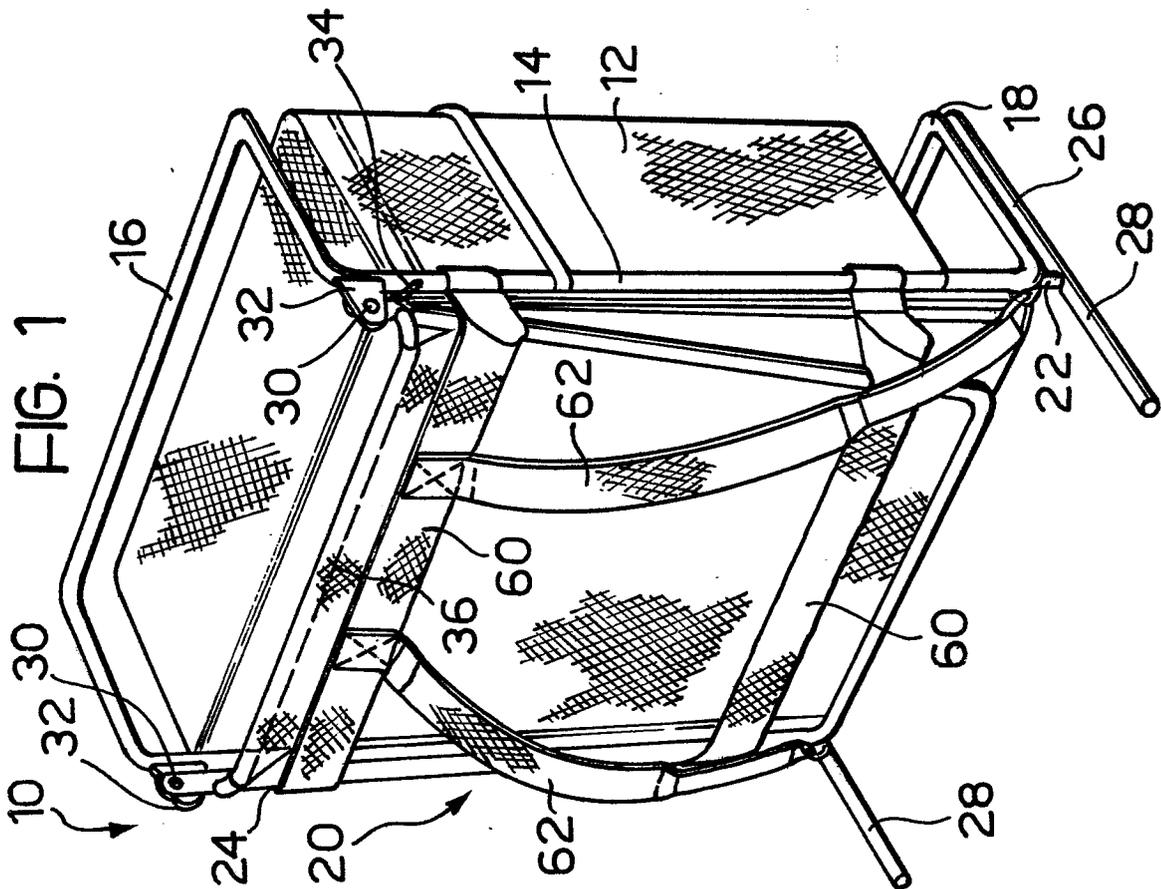
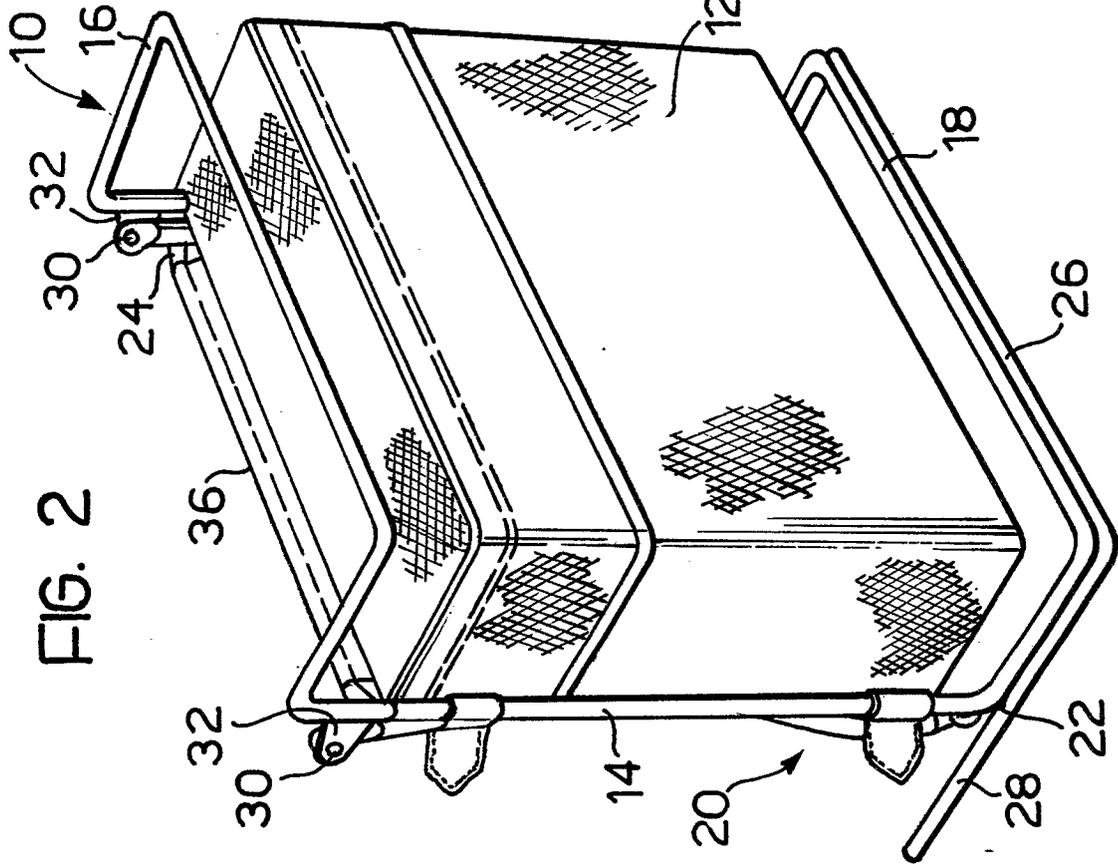
14. Rucksack according to one or more of the preceding claims, characterised in that it is provided with at least two flexible, transverse, back straps (60)  
10 releasably connected to the support frame (14) to act as retaining elements for the extensible structure (20) in the contracted, carrying state thereof.

15. Rucksack according to one or more of the preceding claims, characterised in that it is further provided with a pair of shoulder, carrying straps (62)  
15 releasably attached to the extensible structure (20).

16. Rucksack according to any one of the preceding claims, characterised in that the components  
20 (14,22,24;14,68;72) of the extensible structure (20) are formed from tubular frames, preferably of metal, for example a light alloy.

25 17. Extensible structure associated with a rigid support frame for a rucksack substantially as described and illustrated in the appended drawings.

18. Rucksack with an extensible support structure  
30 substantially as described with reference to the appended drawings.



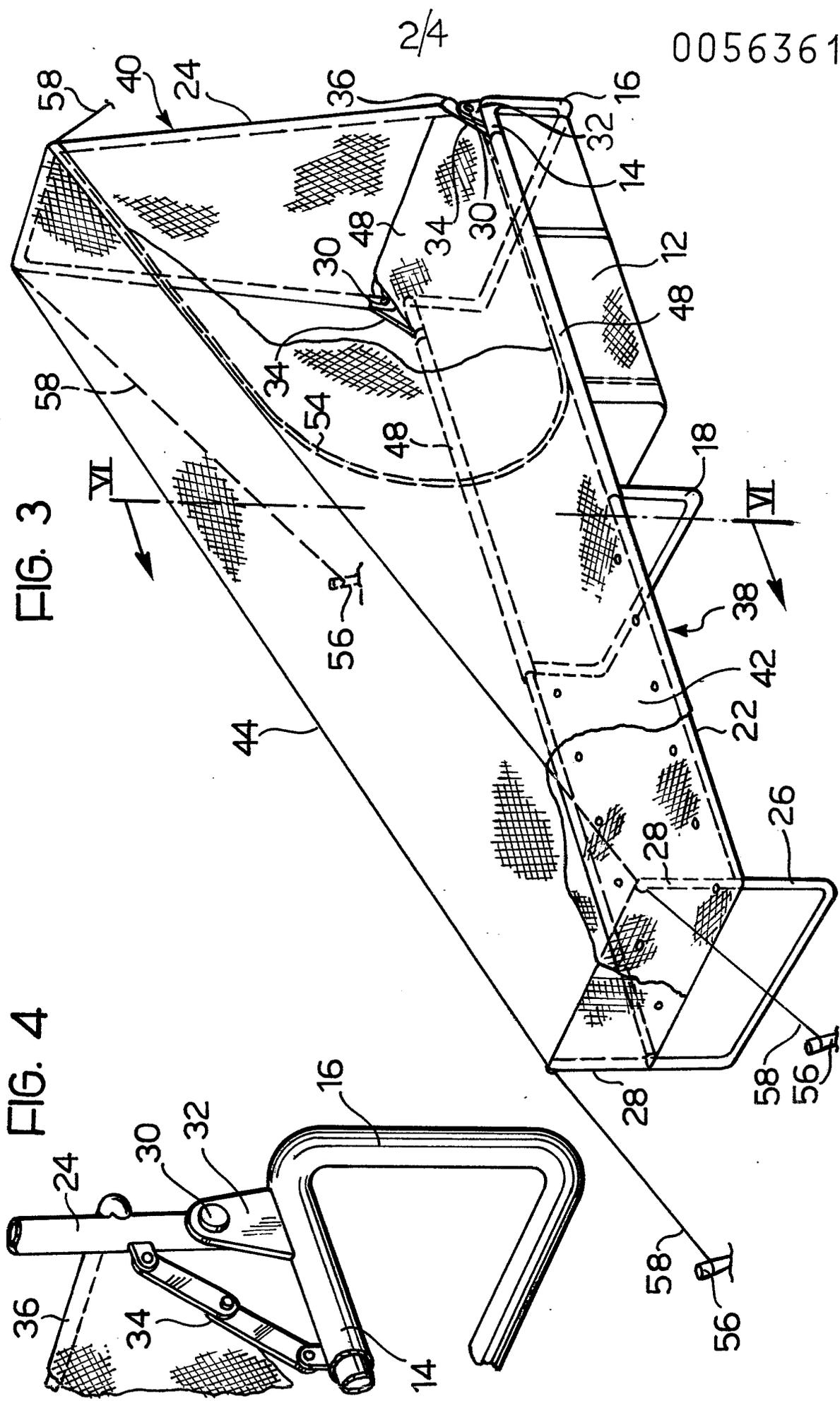


FIG. 3

FIG. 4

FIG. 5

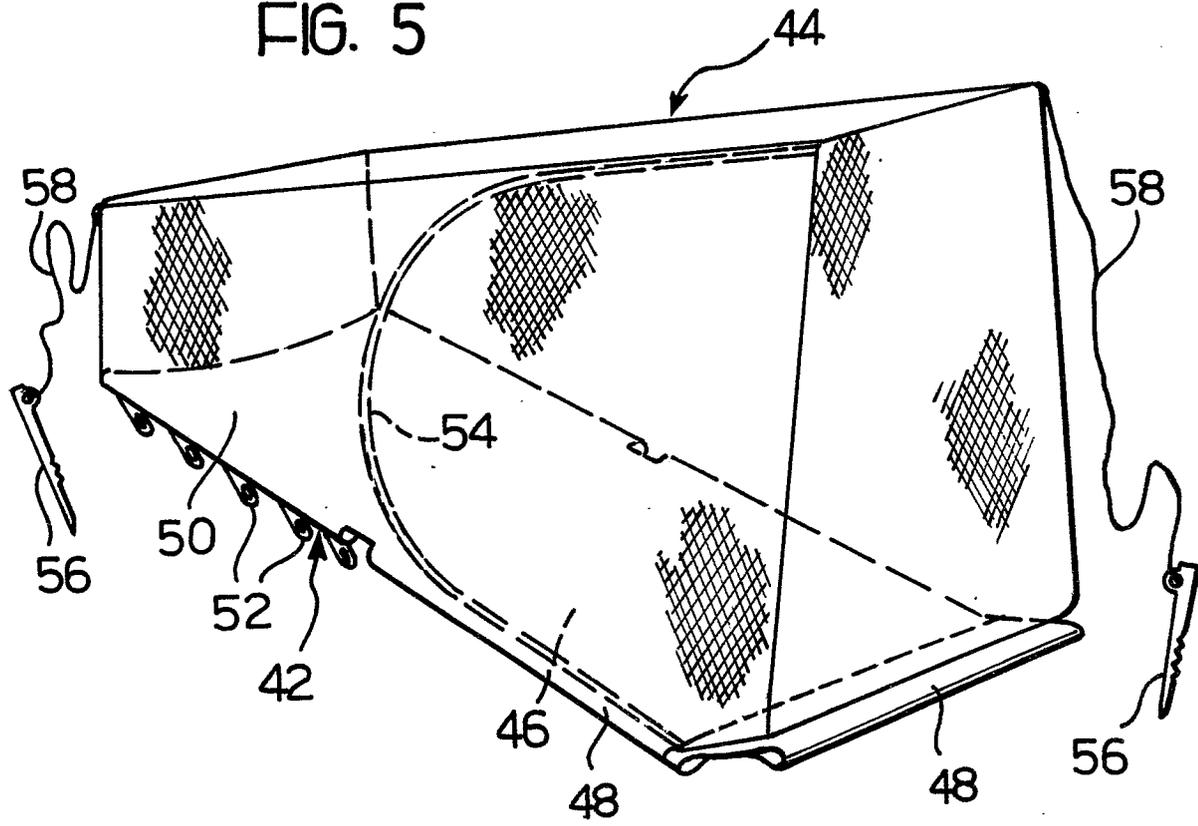
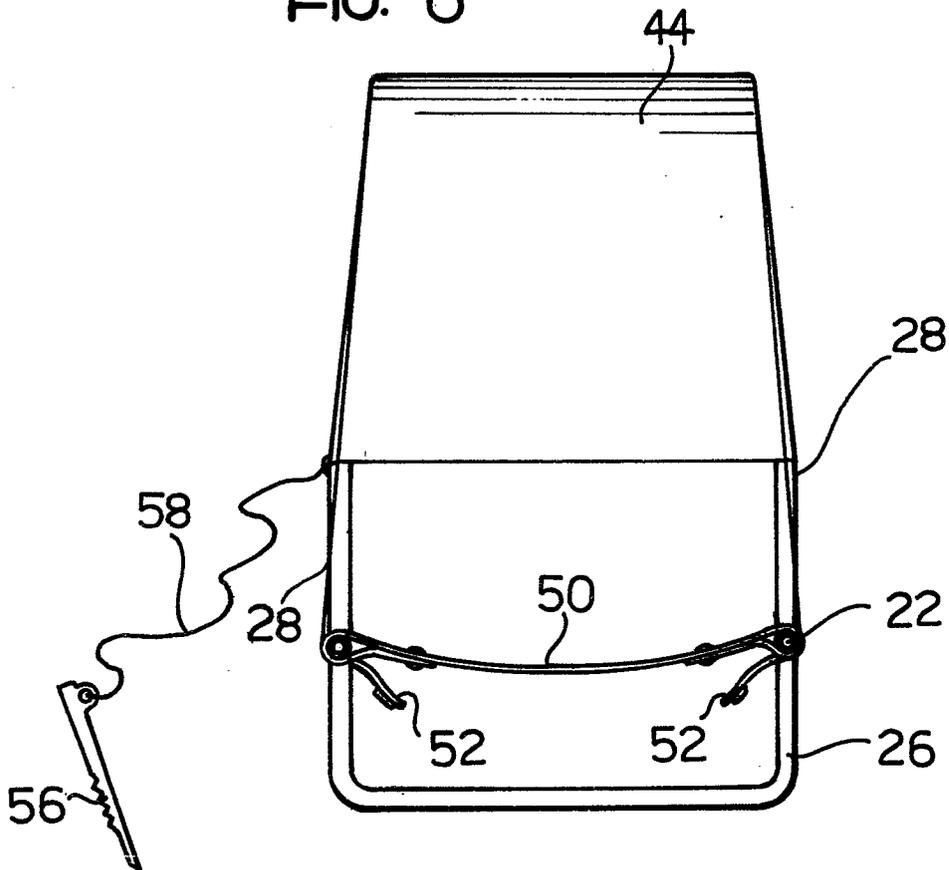
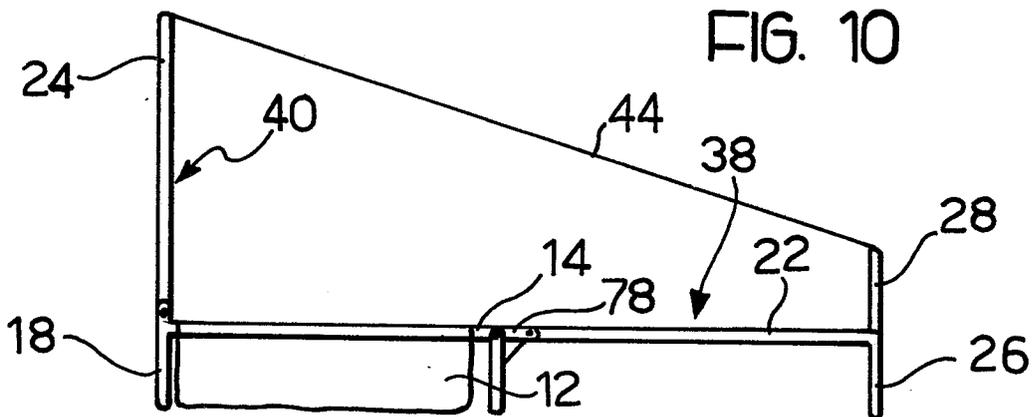
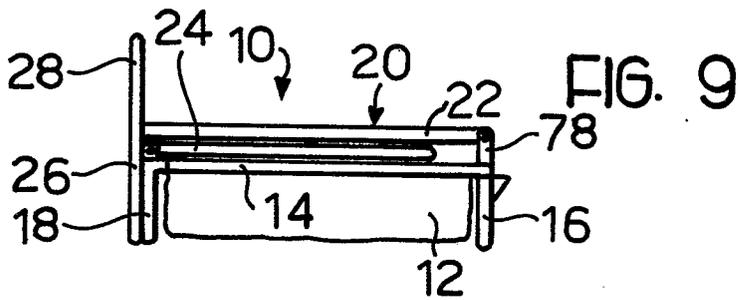
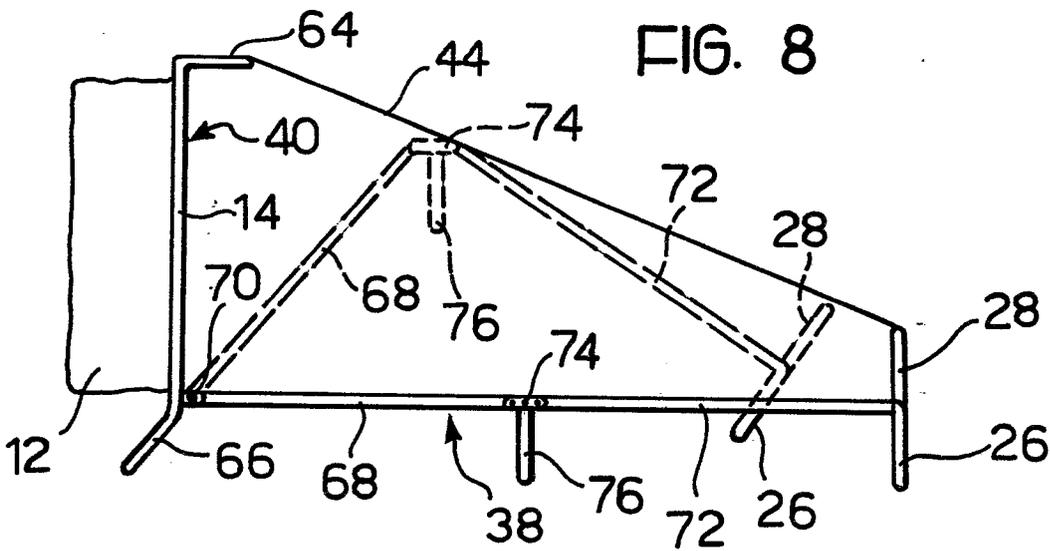
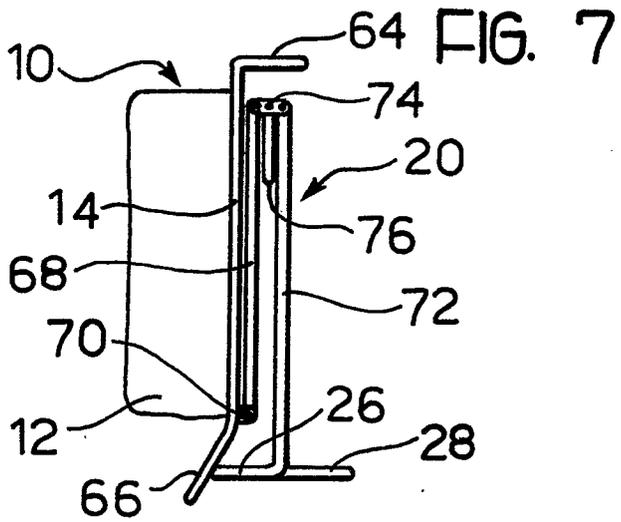


FIG. 6







DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	US-A-3 971 495 (VELAZQUEZ)  *The whole document*	1-4, 6, 7, 9-11, 15-18	A 45 F 4/02
A	GB-A-1 536 401 (RALPH)  *The whole document*	1-3, 5, 6, 8, 10, 11, 15-18	
A	US-A-4 234 005 (TAYLOR)  *The whole document*	1, 2, 7-11, 15-18	
A	FR-A-2 331 301 (VISCARO)		TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	FR-A-2 361 842 (DE BRUYN)		A 45 F
A	US-A-3 828 992 (CERCHIONE)		
A	US-A-3 158 299 (WEIER)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26-04-1982	Examiner SIGWALT C.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			