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US 2767707 A

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ONLINE: EPODOC, WPI, PAJ

(54) Abstract Title
DVT exercise device

(57) An exercise device comprises a six sided, hexagonal cylindrical unit, figure 3, that is rolled beneath the feet of the passenger to stimulate blood flow and thus prevent deep vein thrombosis in flight. The cylinder may be formed from a flat packed, pre-shaped, cut and creased corrugated cardboard blank. The blank may be reinforced by litho laminate paper having assembly instructions printed thereon. End flaps (10 and 13, figure 1) may be provided which when folded in increase structural rigidity. Protrusions (2, figure 1) may be provided for extra stimulation of the soles of the feet. The device may be conveniently stored part assembled but flattened (figure 2) in the aeroplane until required and disposed of after use.

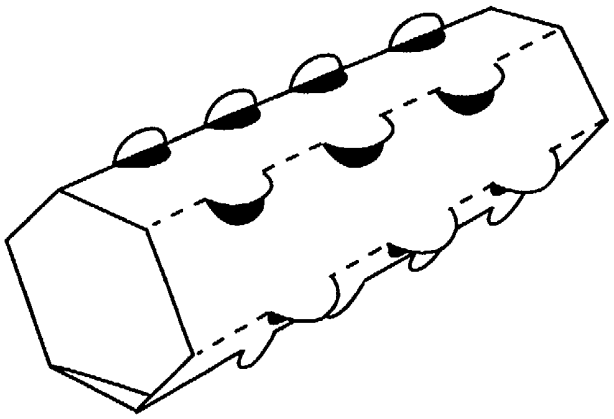

FIG. 3

GB 2 374 550 A

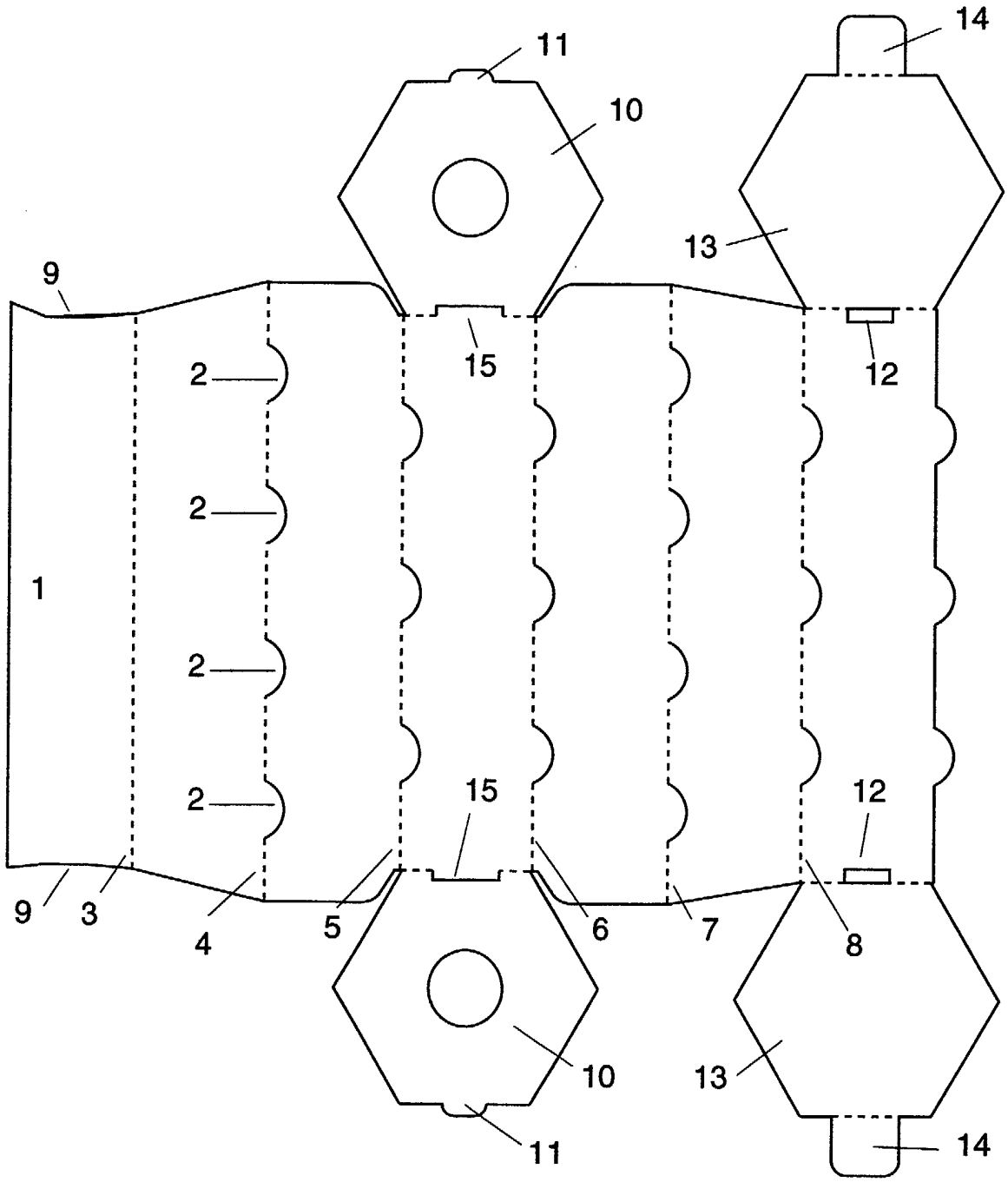

FIG. 1

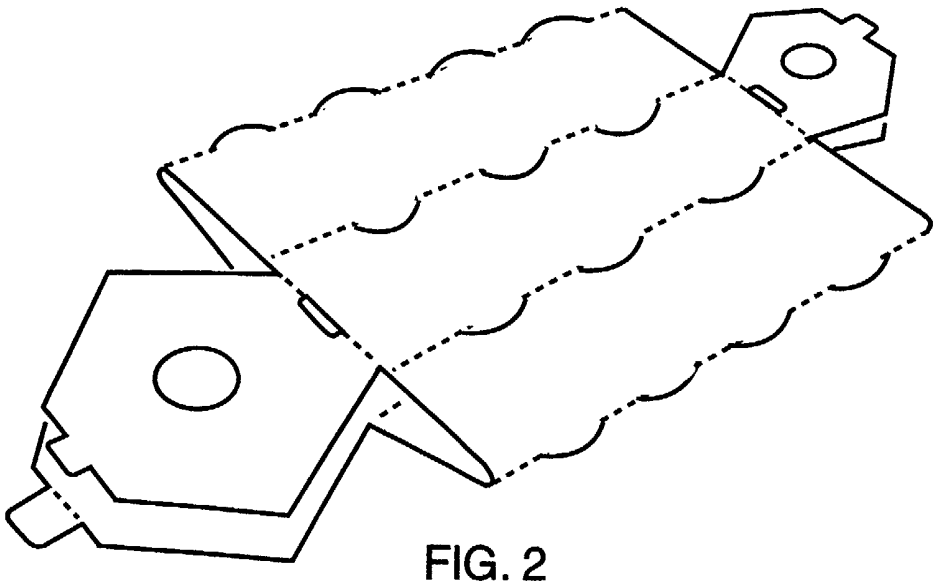

FIG. 2

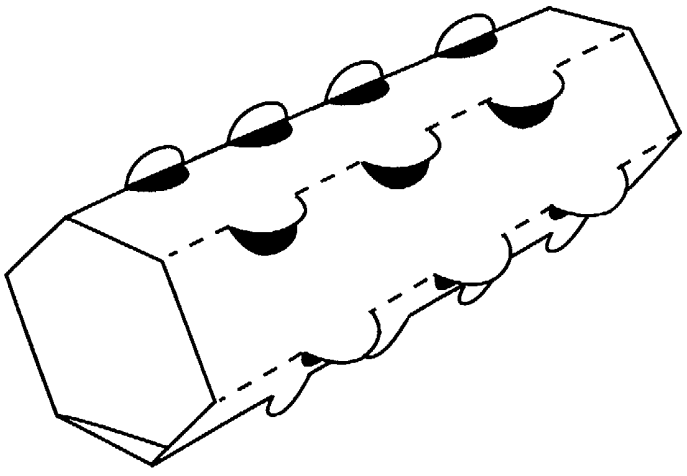

FIG. 3

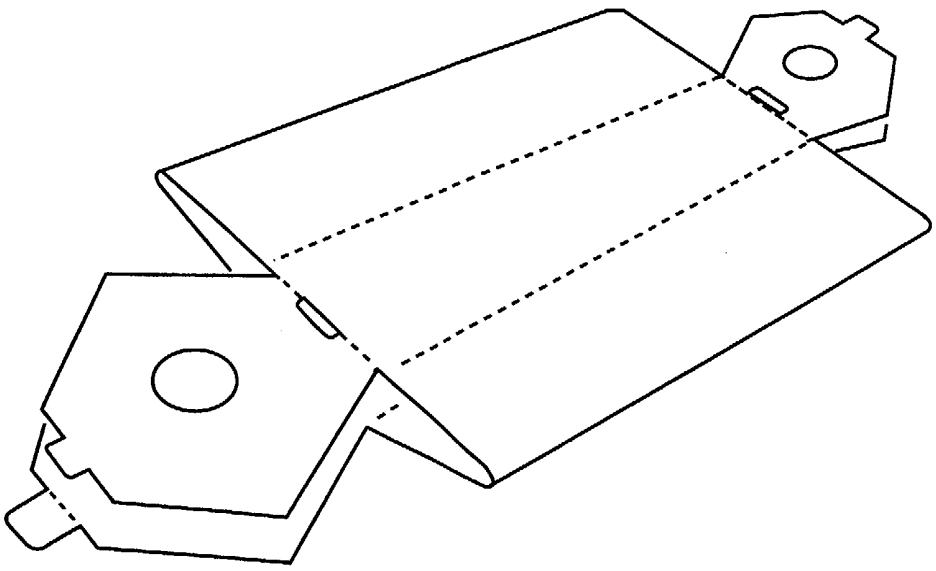

FIG. 4

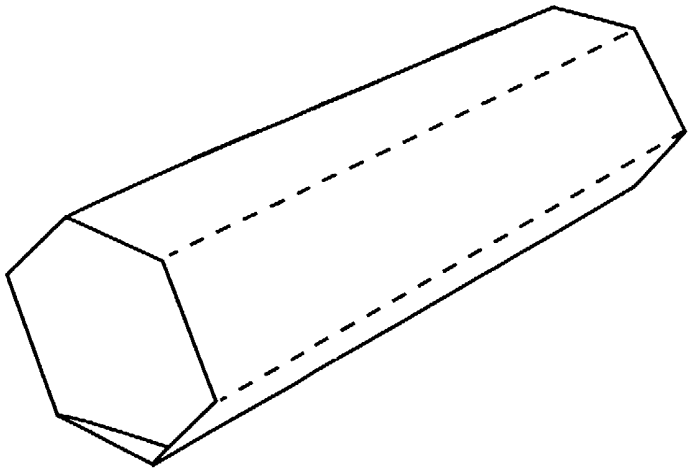

FIG. 5

IN-FLIGHT DVT LIMITER

This invention relates to an "In-Flight DVT Limiter"

In recent years there has been a growing awareness that air travel can cause a Deep Vein Thrombosis known as a "DVT". Several airlines have been introducing either in-flight announcements or videos encouraging passengers to do various exercises to try to prevent the possibility of developing a DVT. One of the most important exercises is to keep the feet and ankles moving and, on long flights, to actually get up and walk around occasionally. However, many passengers are reluctant to do either of these things as they would feel self conscious. This invention seeks an alternative way to avoid the possibility of developing a DVT.

The invention is simple in context. It is constructed in E Flute corrugated cardboard reinforced with Litho Laminate paper and is provided as a flat unit which the passenger assembles according to simple instructions provided. When assembled, the unit becomes a six sided tube-like object with small protrusions. The passenger rolls the unit backwards and forwards under the soles of his or her feet and both the leg movements and the protrusions assist in keeping the blood circulating and therefore helping to avoid the development of a DVT. The reason for it being produced as a flat unit rather than preassembled is that it will assist airlines in carrying sufficient numbers for all passengers without taking up undue space in the aeroplane. Also, it is manufactured in cardboard to keep the amount of weight to the minimum. After use, passengers can either destroy them or take them for their personal use.

The invention is described below in conjunction with the accompanying drawings:-

FIGURE 1 shows the flat piece as initially manufactured.

FIGURE 2 shows the unit as provided to the airline/passenger.

FIGURE 3 shows the finally assembled unit ready for use.

FIGURE 4 shows the unit as in FIGURE 2 but without the protrusions and

FIGURE 5 shows the unit as in FIGURE 3 but without the protrusions.

The instructions to the user for both assembly and use are clearly printed on the Litho Laminate paper which is stuck as a sleeve to the card to give extra strength to the unit. Litho Laminate paper may also be stuck to the underside of the cardboard if even more strength is considered necessary.

FIGURE 1 shows the unit as initially produced by the manufacturer. It has lines, 3 to 8, which are creased sufficiently to enable the unit to be bent to form a six sided object. It has three or four semi-circular cut outs, 2, on each of the six sections to form the protrusions which are provided to help circulation of the blood. It has a flap, 1, which the manufacturer uses to seal the unit after it has been bent into the flat object shown in FIGURE 2 using creases 4 and 7.

The passenger is issued with the unit as shown in FIGURE 2 and follows the instructions for making the further bends, using creases 3,5,6, and 8, to form the six sided tube shape with end locking flaps which tuck in and overlap at each end. The first end locking flaps,10, are placed into position and rest on the edge of the sealed flap,1, (shown as 9 in FIGURE 1) with lugs, 11, locked into slots, 12. Flaps, 10, have a hole in the middle to enable dis-assembly when required. The outer flaps, 13, overlap and are held in position by slotting the end tabs, 14, into slots, 15. This prevents the flaps from being dislodged with use and also provides extra support to the whole unit.

The finished article, FIGURE 3, is then placed under the foot of the passenger (after the removal of shoes) and is rolled backwards and forwards with enough pressure to be able to feel the protrusions reasonably firmly but not so hard that the unit collapses. It will be quite difficult to collapse the unit due to the strength of the cardboard and the stability provided by the end flaps and the Litho Laminate paper.

FIGURE 4 shows an alternative version of the unit as shown in FIGURE 2 and is identical except that it has no protrusions (2 in FIGURE 1).

FIGURE 5 shows an alternative version of the unit as shown in FIGURE 3 and is identical except that it has no protrusions (2 in FIGURE 1).

CLAIMS

1. An in-flight DVT limiter comprising a six sided cylindrical unit as shown in FIGURE 3.

2. An in-flight DVT limiter as claimed in Claim 1 wherein a flat, pre-shaped, creased and cut piece of E Flute corrugated cardboard is produced as shown in FIGURE 1.

3. An in-flight DVT limiter as claimed in Claim 2 which is re-inforced with Litho Laminte paper for extra strength and which contains assembly instructions for the user.

4. An in-flight DVT limiter as claimed in Claim 3 which is sealed with a flap, 1, and shaped by the manufacturer into a flat unit as shown in FIGURE 2.

5. An in-flight DVT limiter as claimed in Claim 4 which is finally assembled by the user into a six sided cylindrical unit as shown in FIGURE 3.

6. An in-flight DVT limiter as claimed in Claims 1, 2, 3, 4 and 5 having protrusions which press on the soles of the feet of the user as it is rolled backwards and forwards.

7. An in-flight DVT limiter as shown in FIGURES 4 and 5 which are in an identical form to those referred to in Claims 1,2,3,4 and 5 except that it does not have the protrusions, 2, shown in FIGURE 1.

8. An in-flight DVT limiter substantially as described herein with reference to FIGURES 1,2,3,4 and 5 of the accompanying drawings.

Application No: GB 0109783.1 **Examiner:** Steven Gross
Claims searched: 1-8 **Date of search:** 15 August 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A6M(MAX), A5R(REQ), (RER), B8P(PB1), (PK13)

Int Cl (Ed.7): A63B23/00, 23/04, 23/10, A61H7/00, 15/00

Other: Online: EPODOC, WPI, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 2767707 A (TOIVONEN) See whole document	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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