

MOULDED OBJECTS

5 This invention relates generally to moulded objects, especially large hollow objects, and is more particularly concerned with stiffening or reinforcing arrangements for such moulded objects.

One preferred application of the present invention is to the moulding of plastics loudspeaker cabinets.

10 It is known to make loudspeaker cabinets from plastics materials by the use of injection moulding techniques. However, the tooling costs for injection mouldings are very high and it is one object of the present invention to provide a loudspeaker enclosure which can be made from plastics material at much lower
15 cost.

It is a further object of the present invention to provide a moulded plastics loudspeaker enclosure which is sufficiently stiff to behave properly acoustically.

20 It is yet a further object of the present invention to provide a loudspeaker enclosure or cabinet which is strong enough to withstand the rigours of "road use" in mobile music applications.

25 In accordance with one aspect of the present invention there is provided an article comprising a closed or substantially closed, generally hollow, moulded housing having an internal framework of elongate tubular reinforcing members formed integrally with the housing in the moulding of the latter, the
30 framework having members extending in at least two mutually perpendicular directions within the housing between opposed walls of the housing.

The reinforcing members may comprise hollow
35 tubes of plastics material. Preferably, these stiffening tubes extend in three mutually perpendicular

directions.

In order that the invention may be more fully understood, one embodiment of loudspeaker enclosure in accordance with the invention will now be described by way of example and with reference to the accompanying drawing which is a schematic illustration of a moulded plastics loudspeaker enclosure incorporating a stiffening arrangement in accordance with the invention.

As shown in the drawing, the loudspeaker enclosure comprises a box-like housing 10 of plastics material, for example polyethylene or polypropylene. The front wall 12 of the enclosure or housing 10 is provided with a circular hole 14 for the mounting of a loudspeaker unit (not shown). The housing is internally stiffened by a plurality of integrally moulded stiffening "tubes" 16 which, as shown, extend in three mutually perpendicular directions, respectively at right-angles to opposite pairs of walls of the housing. In the illustrated embodiment there are two vertical tubes, three horizontal transverse tubes and two horizontal tubes extending from front to back of the housing. However, the number and configuration of the internal stiffening tubes may be modified as desired. As illustrated, each of these stiffening tubes 16 is hollow and terminates in a hole in the housing wall. The tubes 16 may have a diameter of the order of 50 mm. The complete article can be made by rotational moulding.

Where the tubes 16 pass each other within the volume of the enclosure they can be interconnected in order to provide additional bracing. This interconnection can be effected by natural fusing together of the plastics material during the moulding operation, or alternatively by bonding, e.g. by means

of adhesive, if the tubes are hard.

5 Although in the illustrated embodiment the tubes 16 are shown as ending flush with the external surface of the housing, they could alternatively be of greater length so as to extend beyond the housing walls. In this way they could provide attachment points for "hardware", i.e. for pole-mountings, flying, stacking, etc. This can also form a styling feature. 10 Alternatively, the ends of the tubes and the holes could be hidden by plastics caps, fabric, or some alternative masking or screening material. The tubes themselves could be fitted with end caps.

15 In order to reduce the number of apertures in the housing walls, some of the tubes 16 can end short of the housing walls, i.e. terminate within the housing, yet still provide a stiffening function, i.e. be "blind" tubes, by virtue of being interconnected to others of the tubes.

20 Although the invention has been described above with particular reference to loudspeaker enclosures, it is to be understood that the invention is applicable to the moulding of all large, generally hollow objects, particularly those of a volume greater than about 1 cu. ft., where internal stiffening is 25 necessary or desirable.

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CLAIMS: 1. An article comprising a closed or substantially closed, generally hollow, moulded housing having an internal framework of elongate tubular reinforcing members formed integrally with the housing in the moulding of the latter, the framework having members extending in at least two mutually perpendicular directions within the housing between opposed walls of the housing.

2. An article as claimed in claim 1, in which the reinforcing members are hollow tubes of plastics material.

3. An article as claimed in claim 1 or 2, in which said reinforcing members extend in three mutually perpendicular directions.

4. An article as claimed in claim 3, in which the housing is cuboid and the reinforcing members extend respectively at right-angles to opposite pairs of walls of the housing.

5. An article as claimed in any preceding claim, in which the reinforcing members each terminate in a hole in a wall of the housing.

6. An article as claimed in any preceding claim, in which some of the reinforcing members terminate within the housing.

7. An article as claimed in any preceding claim, in which the reinforcing members are interconnected by natural fusing.

8. An article as claimed in any preceding claim, in which the housing is a loudspeaker cabinet or enclosure.

9. An article as claimed in claim 8, which is generally cuboid in shape with a hole in one wall thereof for the mounting of a loudspeaker unit.

10. An article substantially as hereinbefore described with reference to the accompanying drawing.

