Apparatus for supporting insulation in structures such as buildings, comprises an insulation holding portion and at least one supporting flange. The apparatus may comprise an insulating material and the flange may be adapted to engage a structural element of the building such as a joist. The apparatus may have complementary portions which allow one said apparatus to engage an adjacent apparatus. The insulation holding portion may comprise a base and side walls and may form a trough. The insulation holding portion may be formed from plastic or mesh or from double skinned plastic. The apparatus may have apertures for pipe or cables. The apparatus may be reinforced by ribs. The apparatus may be foldable. The apparatus may be colour coded. An insulation system and a method of insulating a structure using such apparatus.
Insulation Apparatus and Method

Field of the Invention

The invention relates to an insulation apparatus, in particular an apparatus for supporting insulating materials in buildings. The invention also relates to an insulation system and a method of insulating a structure.

Background of the Invention

Insulation is added to buildings to conserve energy by preventing heat loss through floors, walls, ceilings and lofts. As well as thermal insulation, buildings may be insulated to prevent noise.

Common forms of insulating materials include polystyrene, fibreglass, foam, plastic fibres or natural fibres. They may come in the form of blocks, boards, rolls, loose fill, foam, batts etc.

The conventional way to lay insulation, for example under a floor, is to lay nets across floor joists and pack insulation between the floor joists. The nets are required to hold the insulation in place and prevent it from falling through the space between joists. This method is time consuming as nets must first be laid and then sufficient insulation material must be tightly packed onto the net between the joists. A disadvantage of this method is that it often leads to ineffective insulation where the ends of the insulation material become compressed due to positioning on the nets.

Another conventional method of laying insulation is to support the insulation on laths which are screwed to opposing surfaces on floor joists. Again, attaching the laths and packing the material onto
them can be time consuming and this method is sometimes ineffective as it is possible for the insulation to fall between floor joists.

A further disadvantage associated with both of the above methods is that pipes such as water or heating pipes often run at or below the level of insulation. Insulation may need to be removed to insert pipes after the building has been insulated. Also, access to pipes for maintenance or repair may be restricted or may require removal of a section of insulation and support.

It would therefore be desirable to provide an improved insulation support apparatus.

Summary of the Invention

One aspect of the invention provides an insulation support apparatus as specified in Claim 1.

Another aspect of the invention provides an insulation system as specified in Claim 22.

Another aspect of the invention provides a method of insulating a structure as specified in Claim 24.

Yet another aspect of the invention provides an insulated structure as specified in Claim 25.

The invention provides an insulation support apparatus comprising an insulation holding portion and at least one supporting flange.

In one embodiment the apparatus may also comprise insulating material.

Preferably, the supporting flange or flanges is/are arranged to engage a structural element of a building such as a joist or cladding.
In a preferred embodiment, at least one portion of the apparatus is complementary to a portion of another apparatus. The apparatus may have an extending portion at one end, which may be arranged to engage a receiving portion of an adjacent apparatus when in use.

Advantageously, each flange may include a region complementary to another flange such that the apparatus may co-operate with an adjacent support apparatus. Adjacent flanges may have overlapping and/or interlocking regions.

Preferably, the insulation holding portion comprises a base and at least one side wall extending from at least one flange. The insulation holding portion may be formed of plastic and/or mesh. The insulation holding portion may be in the form of a trough.

In a preferred embodiment the support apparatus includes strengthening elements such as ribs.

The support may be formed of double skinned plastic. The plastic may be recycled plastic.

Preferably the support and/or the insulation holding portion are substantially rigid.

The side walls may be foldable towards the base of the insulation holding portion. The flanges may be foldable toward the base and/or the sidewalls.

Advantageously, the support apparatus may comprise openings. The openings may be holes or open regions in a mesh.

The openings may be arranged to accommodate pipes such as water pipes or cables.

Advantageously, the support apparatus may comprise sound deadening elements, such as one or more layers of sound deadening materials.
Another aspect of the invention provides an insulation system comprising more than one apparatus for supporting insulation.

Advantageously the insulation system is coded such that apparatus is readily identifiable. Preferably the system provides easy identification of each apparatus, with or without insulation, according to its properties.

In a preferred embodiment the insulation system is colour coded.

Another aspect of the invention provides a method of insulating a structure such as a building, comprising the steps of a) engaging at least one supporting flange of an apparatus for supporting insulation with a structural element of a building and b) securing the apparatus to the structural element of a building.

Yet another aspect of the invention provides an insulated structure comprising structural elements, at least one support apparatus and insulating material.

**Brief Description of the Drawings**

Figure 1a shows a schematic representation of one embodiment of the invention.

Figure 1b shows a side view of the invention of Figure 1a.

Figure 2a shows a side view of the invention of Figure 1a.

Figure 2b shows a side view of the invention of Figure 1a.

Figure 3a shows a schematic representation of the invention of Figure 1a.

Figure 3b shows a schematic representation the invention of Figure 1a.
Figure 3c shows a schematic representation of the invention of Figure 1a.

Figure 4 shows an alternative embodiment of the invention.

**Detailed Description of the Preferred Embodiments**

As shown in Figures 1a and 1b, an insulation support 1 comprises flanges 2 and troughs 3. The flanges 2 may be stapled or nailed into position on joists 4 or studding in floors, walls and ceilings.

Insulation material 5 is supported within the troughs 3. In the embodiment shown in Figure 1, the apparatus comprises eight troughs. However, the number of troughs may be varied. In an alternative embodiment the insulation support 1 may have a single trough 3.

In a preferred embodiment, each trough 3 has ribs moulded into it for strength. The base of the troughs 3 may be solid or may include mesh or other openings to allow the insulation material to breathe. The mesh region may be a plastic type mesh arrangement or, for example, netting material. Similarly, the walls of the troughs 3 may be solid or include openings as different types of insulation have different properties and requirements.

The insulation support 1 may also include holes for electrical cables or water pipes.

The insulation support 1 is preferably made of plastic. Different grades of plastic may be selected according to the particular intended application of the support. In a preferred embodiment, the
insulation support 1 is made of double skinned plastic, with an air gap between inner and outer layers of plastic. A suitable material is fluted polypropylene.

Insulation supports 1 may be coded for different sizes or applications, such that they are readily identifiable. For example, insulation supports may be colour coded so that those for use with floors are blue and those for use with walls are coloured brown.

In a preferred embodiment, each support is around one metre in length.

Because floor joists may be spaced at different distances in different buildings and insulation requirements may vary according to the area of type of insulation material, the width and depth of the supports 1 may be varied.

In use, insulation material 5 is packed into the troughs 3 after supports 1 have been secured in place on joists or wall studding. This means that insulation can be laid very quickly because there is no need to screw additional supports to the joists. The supports, which are preferably around 1m long, can simply be laid between joists and stapled in place. In this way a large area can be covered very quickly.

Alternatively, the support 1 and insulation 5 may be a ready-made unit that can be applied to floors, walls or ceilings in a single step. This means that insulation supports and insulation may be laid directly onto joists simultaneously.

The insulation 5 is packed tightly against the walls of the troughs 3, which secures it in position.
Figure 2a shows a side view of a number of supports 1a, 1b, 1c and 1d, holding insulation 5 between floor joists 4. Flooring 6 such as wooden flooring is laid over the floor joists 4.

This arrangement is beneficial because if work needs to be carried out after insulation and/or flooring has been laid, the flooring and/or supports 1 in a particular region can be removed and replaced without affecting insulation under the rest of the floor. If pipes or cables need to be laid in a section of the insulation layer, the supports 1 can be removed and holes can be drilled in the necessary parts of the supports.

The supports 1 may have holes pre-drilled in them.

The supports 1 are arranged in rows between floor joists 4. As illustrated in Figure 2b, the flanges 2 cover substantially the entire width of the joists 4 and flanges 2 of supports in adjacent rows overlap. In a preferred embodiment each flange 2 is around 50mm in length.

Figures 3a and 3b show two adjacent supports 1' and 1" in the same row. They are positioned between two joists 4.

The adjacent ends of the supports 1 in the same row are shaped such that they fit together. At one end of support 1', an extending portion 7 is arranged to overlap a receiving portion 8 at the end of the adjacent support 1". The length of the extending portion 7 and hence the region of overlap with the receiving portion 8 is preferably around 50mm.

These complementary flanges 2 and extending/receiving portions 7,8 make laying the supports in the correct positions easier and ensures that insulation material is evenly distributed. Adjacent
flanges 2 may be overlapping and/or interlocking. Similarly, adjacent extending portions 7 and receiving portions 8 may be shaped such that they overlap and/or interlock.

The supports 1 may be stackable for storage and the flanges 2 may cooperate in the stacked position to strengthen a stack of supports 1.

Sound insulating or sound deadening materials (not shown) may be added to one or more sides of the supports 1. This could be applied using sound deadening adhesive tape. In a preferred embodiment sound deadening materials are applied to the base of the trough 3 and to one of the flanges 2.

As shown in Figure 3c, the support 1 is formed from a double skinned material, such as double skinned plastic. This has an inner layer 9 and an outer layer 10. An air gap 11 between the layers of plastic provides additional insulation and the double skinned material is strong such that the support 1 will not bend under the weight of insulating material. Extra support and strength is provided by ribs 12 between the layers 9 and 10. The material provides improved rigidity over single layer materials.

The support may be cut or scored to allow folding. Preferably a cut is made in one of the layers 9 or 10 at points 13 shown in Figure 3c. This allows the support 1 to fold for storage, such that the side walls 3' of each trough may be laid flat against the base of the trough 3 and each of the surfaces 2' of the flanges 2 may be folded down flat against the side walls 3'. This allows supports 1 to be stacked substantially flat against each other when stored. When a support 1 is removed from a flat pack, it is biased such that it assumes the shape shown in Figure 3c and is ready for use.

The double skinned plastic provides benefits for acoustic insulation. At the floor joists, flanges 2 of adjacent supports 1 over lap, providing two air gaps 10 in double skinned layers under the floor.
boards. Because the air gap 10 has insulating properties, less insulating material may need to be added to the trough 3.

The support 1 may be made using recycled plastic material. The flanges 2 may include indicia to show a user where to attach it to joists.

Figure 4 shows an alternative embodiment of the invention in which the trough 3 of the support 1 has partial wall or base elements 3'.
Claims

1. Apparatus for supporting insulation comprising an insulation holding portion and at least one supporting flange.

2. Apparatus as claimed in Claim 1, further comprising insulating material.

3. Apparatus as claimed in Claim 1 or 2, wherein the at least one supporting flange is adapted to engage a structural element of a building.

4. Apparatus as claimed in Claim 3 wherein the structural element is a joist.

5. Apparatus as claimed in any of Claims 1 to 4, wherein at least one portion of the said apparatus is complementary to a portion of another apparatus.

6. Apparatus as claimed in Claim 5, wherein the at least one supporting flange comprises a region complementary to another supporting flange.

7. Apparatus as claimed in Claim 6, wherein, in use, adjacent supporting flanges overlap.

8. Apparatus as claimed in Claim 6 or 7, wherein, in use, adjacent supporting flanges interlock.

9. Apparatus as claimed in any of Claims 5 to 8, wherein, in use, an extending portion of one apparatus engages a receiving portion of an adjacent apparatus.

10. Apparatus as claimed in any preceding claim, wherein the insulation holding portion comprises a base and at least one side wall extending from the flange.

11. Apparatus as claimed in Claim 10, wherein the insulation holding portion is a trough.

12. Apparatus as claimed in Claim 10 or 11, wherein the insulation holding portion is formed from plastic and/or mesh.

13. Apparatus as claimed in Claim 10 or 11, wherein the insulation holding portion is formed from double skinned plastic.

14. Apparatus as claimed in Claim 13, wherein the insulation holding portion is substantially rigid.
15. Apparatus as claimed in any preceding claim, further comprising strengthening elements.

16. Apparatus as claimed in Claim 15, wherein the strengthening elements are ribs.

17. Apparatus as claimed in any preceding claims, further comprising openings.

18. Apparatus as claimed in Claim 17, wherein the openings are arranged to accommodate pipes or cables.

19. Apparatus as claimed in any preceding claim, further comprising sound deadening elements.

20. Apparatus as claimed in any of claims 10 to 19, wherein at least one side wall is foldable towards the base of the insulation holding portion.

21. Apparatus as claimed in any of claims 10 to 20, wherein at least one supporting flange is foldable towards the at least one side wall.

22. An insulation system, comprising more than one apparatus for supporting insulation as claimed in Claim 1, wherein each apparatus for supporting insulation is coded according to its properties.

23. An insulation system, as claimed in Claim 22, wherein each apparatus for supporting insulation is colour coded according to its properties.

24. A method of insulating a structure, comprising the steps of:
   a) engaging at least one supporting flange of an apparatus for supporting insulation as claimed in any of claims 1 to 21 with a structural element of a building; and
   b) securing the apparatus to the structural element of a building.

25. An insulated structure comprising a plurality of support elements, at least one apparatus as claimed in any of claims 1 to 21 and insulating material.

26. Apparatus, insulation system or a method substantially as shown in and described with reference to the drawing
Application No: GB0809626.5  
Claims searched: 1-25  
Examiner: Eleanor Wade  
Date of search: 11 November 2008

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

<table>
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<tr>
<th>Category</th>
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| **X**    | 1-7,9,10,11,15,16,22-25 | GB2204340 A  
Serpell  
see figures |
| **X**    | 1-4,10,11,15,17,22-25 | GB2261448 A  
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  - E04B; E04D

The following online and other databases have been used in the preparation of this search report:
- EPODOC, WPI

International Classification:

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