

2013 PAPER P3
SAMPLE ANSWER 3

This script is an example of an answer to the above examination question paper. The answer received a pass mark. It is a transcript of the handwritten answer provided by the candidate, with minimal re-formatting to improve readability.

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A shield for an electrical back box

The invention relates to a shield for an electrical back box, in particular, a shield for protecting an electrical back box from ingress of building material.

When fitting out new buildings or refurbishing buildings, such as houses, it is typical to install electrical back boxes in a wall in which wires for standard fittings (eg. sockets, switches) are to be received. This is commonly known as a “first fit”. Subsequently, the fittings themselves are installed onto the back box, known as the “second fit”. Between the first fit and the second fit, the respective wall is typically plastered so to skim over the front edge of the side walls of the electrical back box. This plastering operation frequently causes building materials (eg plaster) to accumulate in the back box, which can be tiresome and time consuming to remove before the second fit.

It is known to install some kind of shield for the back box to prevent such ingress. However, such previously considered shields are inadequate.

A previously considered shield is shown in Figure 1. It comprises a plastic shell 2 insertable in a back box and having flanges 4 engageable with the back box. However, such a construction is prone to falling out of the back box, particularly during a plastering operation, because it relies on precise sizing and fit with the electrical back box. In practical use, back boxes may vary slightly in size or be deformed on installation. The shell may also be relatively expensive to manufacture.

It is therefore desirable to provide an improved shield for an electrical back box.

According to a broad aspect of the invention there is provided a two-part shield for an electrical back box comprising a wall extension part and a support means insertable in the wall extension part to urge the wall extension part against side walls of an electrical back box. The support means secures the wall extension part in place so as to prevent the ingress of building material into the back box.

According to an aspect of the invention there is provided a shield for protecting an electrical back box from ingress of building material, the shield [having the features of claim 1]. The support means may secure the wall extension part in place against external forces, such as those experienced during a plastering operation. The wall extension part may be formed from flexible material. This may allow the wall extension part to be manipulated into place.

The shield may have the features of claim 2. This allows the wall extension part to be easily manipulated into place. The shield may have the features of claim 3. This provides a convenient means for manipulating the shape of the wall extension part to move it into place in the back box. There may be two such hinges. The two hinges may be on opposing side walls of the wall extension part.

The Shield may have the features of claim 4. This provides a stop for the wall extension part and helps to locate the wall extension part in use.

The shield may have the features of claim 5. This provides a means for a further secure attachment, or semi-permanent attachment to the back box.

The shield may have the features of claim 6. A screw may be installed to provide a strong mechanical attachment.

The shield may have the features of claim 7. The legs help to secure the shield in place and to correctly locate the wall-extension part.

The shield may have the features of claim 8.

The shield may have the features of claim 9. This prevents the wall extension part from interfering with pre-installed wires. The legs may leave accessible only a subset of openings.

The shield may have the features of claim 10. This allows the wall extension part to be inexpensively manufactures. The shield may have the features of claim 11.

The shield may have the features of claim 12. This allows the shoulder to be formed inexpensively.

The shield may have the features of claim 13, this allows the wall extension part to be easily and inexpensively shipped and stored.

The support means may be a semi-rigid or rigid plate or block, sized with respect to an electrical back box such that upon insertion it forces the wall extension part against the side walls of the back box to secure it in place.

The shield may have the features of claim 14. This allows the support means to rest against the wall extension part to secure it in place.

The shield may have the features of claim 15. The flanges may be integrally formed with the central insertion portion. This may allow the support means to be manufactures relatively inexpensively.

The shield may have the features of claim 16. This allows the support means to operate whilst avoiding conflict with existing features of the electrical back box.

The shield may have the features of claim 17. This allows the support means, and so the shield as a whole, to be easily removed. The shield may have the features of claim 18. This may be relatively inexpensive to manufacture.

The shield may have the features of claim 19. The shield may have the features of claim 20. This may allow the support means to be manufactured and assembled relatively inexpensively.

The shield may have the features of claim 21. This allows the shield to be operable with a standard electrical back box.

There is also provided a kit for assembling a shield according to the above aspect. This allows the shield to be manufactured relatively inexpensively and assembled as required and/or on-site.

The invention will now be described by reference to the following drawings, in which:

Figure 2 schematically shows in perspective exploded view a shield according to an embodiment of the invention and an electrical back box;

Figure 3 schematically shows in perspective view the wall extension part of the shield of Figure 2 in the process of being inserted into the box;

Figure 4 schematically shows in perspective view the shield of Figure 2 installed in the electrical back box; and

Figure 5 schematically shows in cross-sectional view the shield of Figure 2 installed in the electrical back box in a plastered wall.

As shown in Figure 2 the shield 10 comprises a wall extension part 12 and a support means 14 insertable in standard electrical back box 100 so as to protect the back box 100 from ingress of building materials.

The wall extension part 12 is formed from the flexible sheet material, which in this embodiment is cardboard. The wall extension part is four-sided, the widths of the four sides substantially corresponding to the internal dimensions of the standard electrical back box 100.

The wall extension part 12 has four legs 15 arranged to extend into the back box 100 and trimmable to size for that purpose. The legs 15 are formed at corners of the wall extension part 12 so as to benefit from increased flexural rigidity. A rear portion 16 of the wall extension part comprises the four legs and a single-layer portion of the side walls of the wall extension part 12. A front portion 18 comprises a double-layer portion of the side walls, that is arranged to extend from the front edge of the side walls of the back box 100 in use. An additional second layer of cardboard is provided on the outer side of the side walls (ie. forcing the side walls of the back box 100), thereby forming a shoulder 20 that is arranged to sit on the front face of the back box.

The wall extension part also has two hinge lines 22 formed in its two long sides, which allow the respective side walls to be easily collapsed inwardly (ie. into the space between the four side walls in their expanded or in use configuration).

The wall extension part is also provided with two screw attachment portions 24 at opposite side walls (only one visible in Figure 2).

In this embodiment these are simply folded pieces of cardboard adhered to the side walls with a screw hole arranged to overly a corresponding screw lug 102 of the back box.

The support means 14 comprises a cardboard insert cut or punched from a single sheet of cardboard. The support means 14 has a central insert portion 26 sized to substantially correspond to the internal dimensions of the side walls of the wall extension part 12 when in its in-use configuration. The support means also has foldable flanges 28 on each side that are resiliently biased to an extended portion in which they lie in the plane of the central insert portion 26. The flanges 28 are spaced apart where necessary to provide gaps for the screw lugs 102 of the back box 100.

The support means 14 also comprises two grasping holes 30 formed in the central insert portion of the appropriate size for human fingers to extend there through to remove the support means 14. In this embodiment the grasping holes 30 are formed by folding in flaps 32 punched out of the central insert portion on three of their respective sides.

The back box 100 of Figure 2 is a standard size two socket electrical back box of metal construction having a number of wiring holes 104, and defining a space for receiving a socket and the wires connected to the socket. The back box 100 is provided with two screw lugs 102, to which a socket may be attached, and to which

the screw attachments portions of the wall extension part overly, as described above.

In use, as shown in Figures 3 and 4, the wall extension part 12 is manipulated into place in the back box 100 by squeezing the two side walls having the hinge lines 22 together, so as to partially collapse the wall extension part, reducing its overall length and width along most of its longitudinal extent, such that it can be easily inserted into the back box 100. The legs 14 may need to be trimmed to length (e.g. with scissors) if the back box 100 is partially shallow or there are obstructions. The legs 15 straddle over the screw lugs 102 and leave the wiring holes 104 clear for use.

The side walls of the wall extension part 12 are then moved outwardly against those of the back box 100, either manually or upon insertion of the support means 12. The support means 12 is inserted with the flanges facing towards the back box 100 (although it may be inserted the other way around).

The support means is pushed in until it is deep enough to push the side walls of the wall extension part 12 against those of the back box 100 – i.e. so that it at least partly lies in the same place as the side walls of the back box (see Figure 5).

The wall extension part 12 is now held securely in place and will resist being dislodged in a plastering operation. It will prevent plaster from entering the back box, and a plasterer may work up to the wall extension part, using it as a guide.

If desired, the wall extension part 12 can be further secured in place with a screw through the screw means 24 into the screw lugs 102, before inserting the support means.

After a plastering operation, the support means 14 can be grasped by the holes 30 and removed, loosening the wall extension part with respect to the back box 100 so it too can then be removed.

The second fit may then be completed.

The two-part construction of the shield allows it to be securely retained with low tolerances on sizing, thereby enabling operation with deformed back boxes.

The shield may be provided in kit form – i.e. a net which can be assembled.

In other embodiments, the shield may be formed from plastic. Cardboard is partially cheap, and therefore suitably for trade use. The shield may come in a range of sizes for use with different size back boxes.

In other embodiments, the support means may be a rigid block sized to fit snugly in a back box, thereby forcing the wall extension part into place.

CLAIMS:

1. A shield for protecting an electrical back box from ingress of building material, the shield comprising:

A wall extension part arranged to form an extension of the side walls of an electrical back box, a rear portion of the wall extension part being arranged to be received in the back box and a front portion being arranged to protrude from the back box to prevent the ingress of building material; and

a support means arranged to be inserted into the wall extension part to urge the wall extension part against the side walls of the back box, thereby securing the wall extension part in place.
2. A shield according to claim 1, wherein the wall extension part is collapsible for easy insertion into the back box.
3. A shield according to claim 2, wherein at least one side wall of the wall extension part has a hinge line partway along its length such that the respective side wall can be folded inwardly to partly collapse the wall extension part.
4. A shield according to any one of the preceding claims, wherein the front portion extends outwardly from the rear portion so as to form a shoulder that fits over a front edge of the side walls of the back box.
5. A shield according to any one of the preceding claims, wherein the wall extension part is provided with back box attachment means for making a mechanical connection with the back box to secure it in place.
6. A shield according to claim 5, wherein the back box attachment means comprises at least one screw plate arranged to overlie a screw lug of the back box, whereby a screw may be fitted through the screw plate into the screw lug.
7. A shield according to any one of the preceding claims, wherein the rear portion comprises a plurality of legs arranged to extend into the back box along the side walls of the back box.
8. A shield according to claim 7, wherein at least one of the legs is formed at a corner of the wall extension part such that a corner bend in the at least one leg provides flexural rigidity to the wall extension part.

9. A shield according to claim 7 or 8, wherein the legs are spaced apart and sized so as to extend between and leave accessible openings in the back box and/or fittings within the back box, such as wiring holes and/or screw lugs for a socket.
10. A shield according to any one of the preceding claims, wherein the wall extension part is formed from sheet material.
11. A shield according to claim 10, wherein the wall extension part is formed from cardboard.
12. A shield according to claim 11 when appendant to claim 4, wherein the front portion is formed of a double layer of sheet material.
13. A shield according to any one of claims 10 to 12, wherein the wall extension part is foldable flat.
14. A shield according to any one of the preceding claims, wherein the support means comprises an insert having resilient fingers arranged to urge to wall extension part against the side walls of the back box.
15. A shield according to claim 14, wherein the resilient fingers comprise foldable flanges coupled to sides of a central insert portion of the insert.
16. A shield according to claim 14 or 15, wherein the resilient fingers are spaced apart and sized so as to accommodate fittings within the back box, such as a screw lug for a socket.
17. A shield according to any one of the preceding claims, wherein the support means comprises removal means by which it may be grasped for removal.
18. A shield according to claim 17, where the removal means comprises at least one hole through which a finger of a user may be inserted.
19. A shield according to any one of the preceding claims, wherein the support means is formed from sheet material.

20. A shield according to claim 19, wherein the support means is formed from cardboard.
21. A shield according to any of one of the preceding claims for an electrical back box of standard size having four side walls.
22. A shield substantially as described herein with *reference to figures 2 to 5.
23. A kit for assembling a shield according to any one of the preceding claims, comprising a net for forming the wall extension part and a net for forming the support means.

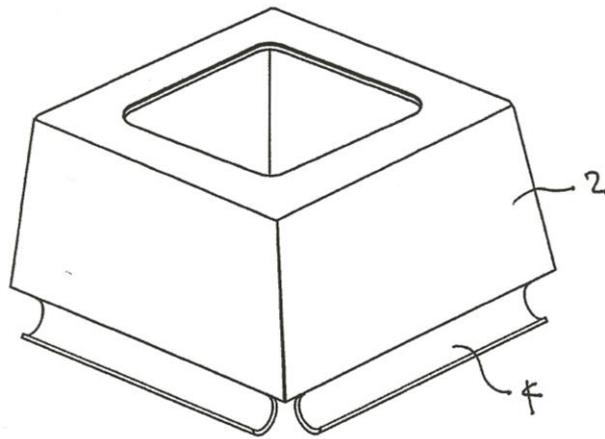
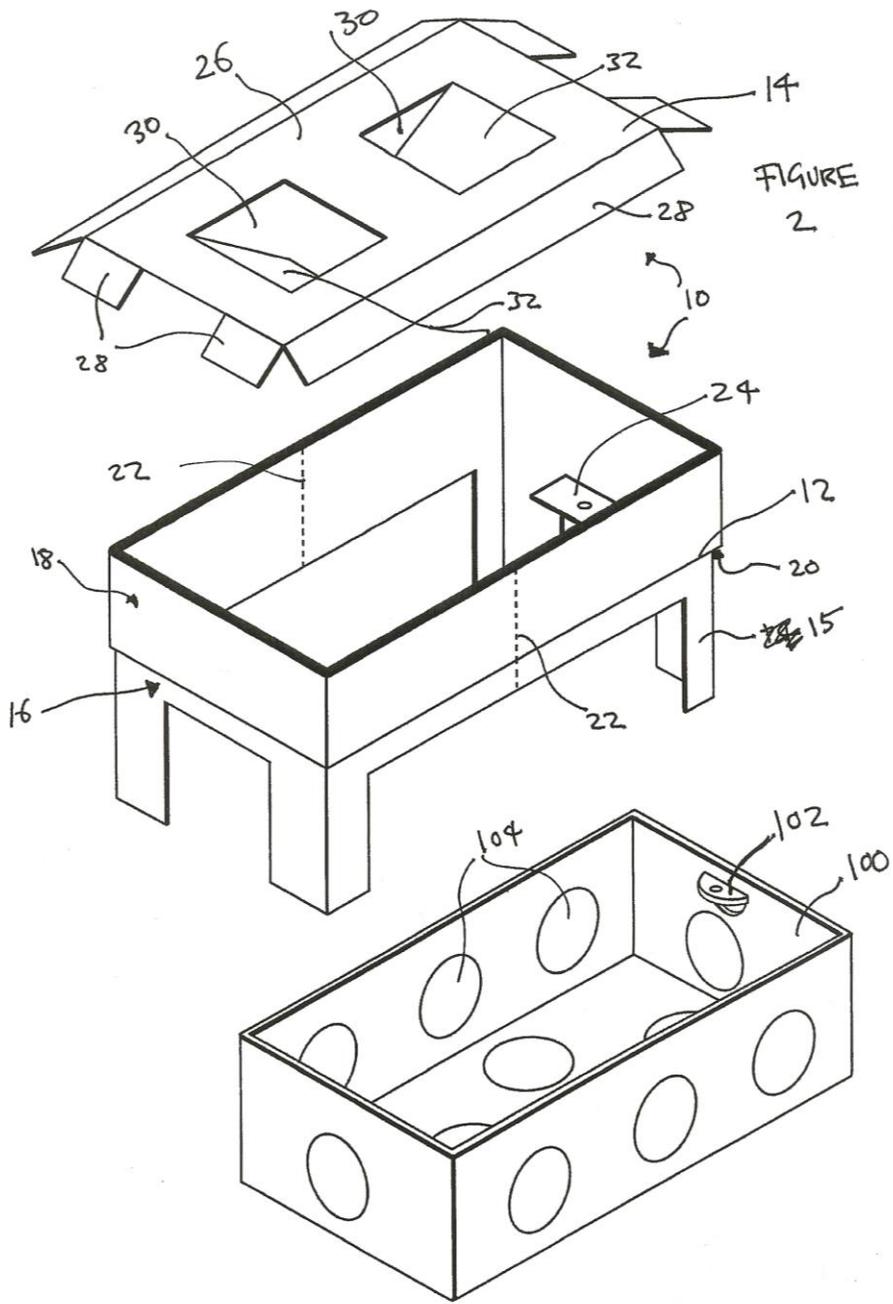
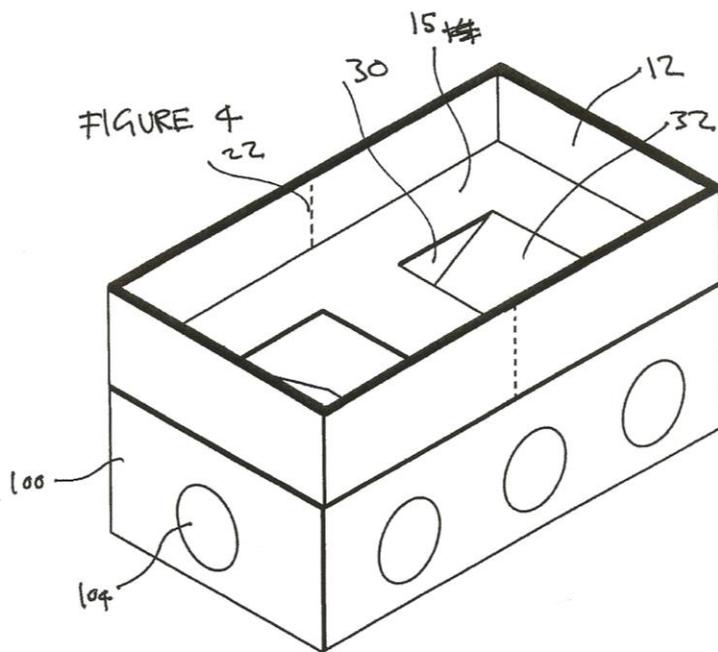
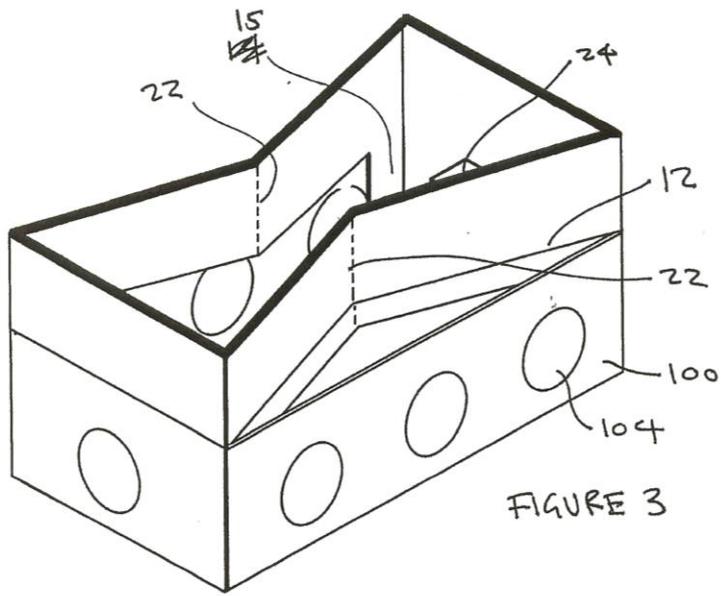


FIGURE 1
(PRIOR ART)





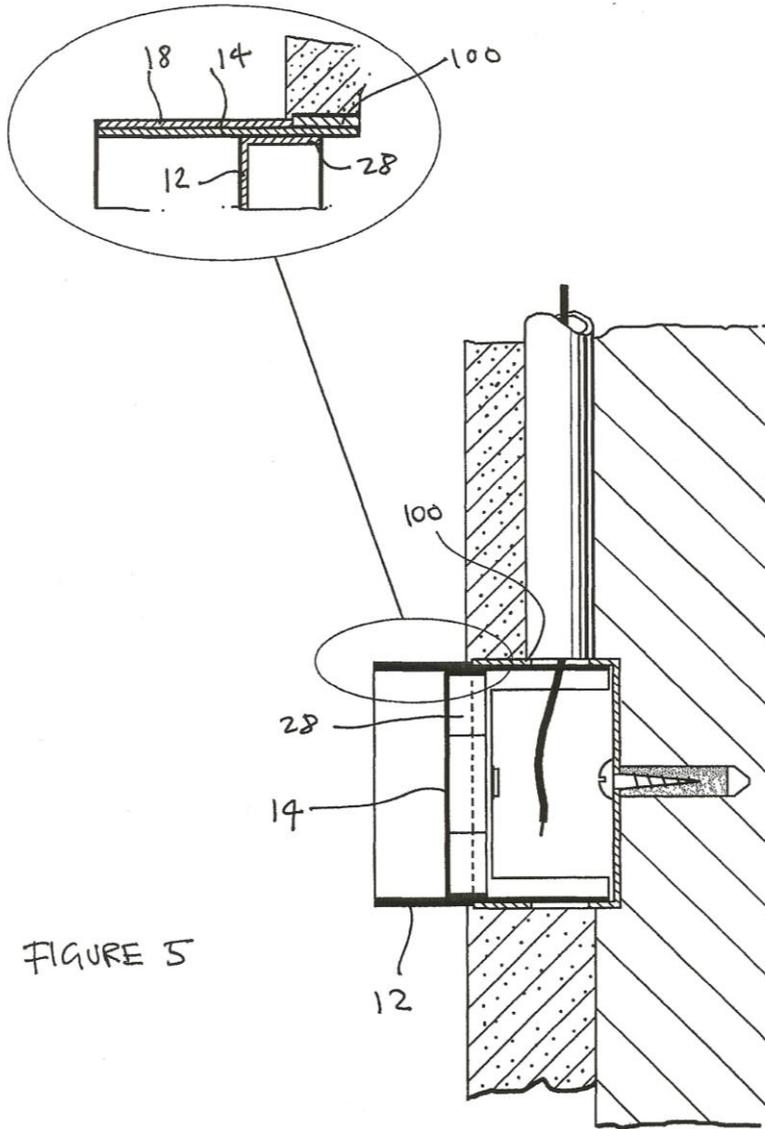


FIGURE 5

ABSTRACT

A shield 10 for an electrical back box 100.

There is disclosed a shield 10 for protecting an electrical back box 100 from ingress of building material. The shield 10 comprises a wall extension part 12 which can be partly inserted into a back box 100 such that it protrudes from the back box forming an extension to the side walls. The shield further comprises a support means 14 insertable in the wall extension part 12 to urge the wall extension part 12 against the side walls of the back box 100 to hold it in place.

In use, the wall extension part 12 is inserted into the back box 100 and then the support means 14. Plaster can then be applied to a surrounding wall up to the protruding part of the wall extension part 12 without getting building materials inside the back box 100.