

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) ELECTRICAL SOCKET-OUTLET

(71) We, M.K. ELECTRIC LIMITED, a Company registered under the laws of Great Britain, of Shrubby Road, Edmonton, London N.9, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an electrical socket-outlet. It is an object of the invention to provide an electrical socket-outlet having two socket contacts and means for screening the said two contacts to prevent a child or the like from receiving a shock on inserting an object into one hole of the socket-outlet.

Accordingly the present invention provides an electrical socket-outlet having two socket contacts for connection with two pin contacts of a plug, the socket-outlet having an insulating casing the front wall of which defines two openings for receiving the contact pins, a shutter rotatably mounted in the socket-outlet and having a pair of forwardly extending projections which in the screening position of the shutter extend into the openings, the shutter being axially movable away from the openings by a push on both projections, means for preventing such axial movement of the shutter in response to a push on one projection only, means for causing the shutter to rotate in response to a push on both projections after it has moved through a predetermined distance away from the front wall and means for urging the shutter to its screening position.

An electrical socket-outlet in accordance with the invention will now be described, by way of example only, with reference to the accompanying drawings of which:—

Figure 1 is a view of the back surface of part of the front wall of the casing of a socket-outlet with a shutter in its screening position,

Figure 2 is a sectional view on the line II—II of Figure 1 with the shutter in its screening position,

Figure 3 is a view similar to Figure 2 showing the insertion of a pin in one opening only, and

Figure 4 is a front view of the shutter of Figure 1.

A two contact electrical socket-outlet has an insulating casing, the front wall of which is shown at 12. The socket-outlet has two current carrying socket contacts which may be of any known form and are omitted from the drawing for clarity. The front wall of the casing is formed with two spaced openings 13 for reception of two contact pins of a plug, the socket contacts being arranged to be engaged by pins inserted through the openings 13. A shutter 14 located in a recess 14A in the back of the front wall and extending generally in a plane parallel to the plane of the front wall is located for rotation about its axis normal to the plane of the wall 12 by means of a pin 17 on the back of the wall 12 engaging in a recess 18 in the centre of the front of the shutter. The shutter has a pair of forwardly extending projections 15, 16 on its front face which in the screening position extend into the openings 13; the front surfaces of these projections are sloped as illustrated in opposite directions so that a push on the front surface of either projection tends to rotate the shutter. The centre of the back face of the shutter is formed with a projection 19 the end of which extends into a well 20 defined by a forwardly projecting part 20A of a casing part 21 secured to the back of front wall 12. The end of projection 19 engages one end of a compression spring 22 which is housed in the well 20, so as to urge the shutter forwardly. The back surface of the wall 12 within the recess 14A, in which the shutter is located, is formed with two abutments 23 having back surfaces 24 which slope away from the front wall in the direction of rotation of the shutter to its open position.

In the screening position of the shutter illustrated, the shutter screens the openings 13 and is prevented from rotation by engagement of the projections 15 and 16 in the openings 13

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and by engagement of abutments 25 (Figure 4) on the shutter with the straight sided wall parts 25A (Figure 1) of the abutments 23. When two pins are inserted into the openings and pushed towards the back of the socket, the shutter is moved axially away from the front face of the casing until the projections 15, 16 are clear of the openings 13 and the abutments 25 are clear of the wall parts 25A. This axial movement is against the pressure of the spring 22. When the projections are clear of the openings, the shutter begins to rotate due to the reaction of the ends of the plug pins with the sloping faces of the projections. By means of the two abutments 25 on the shutter now engaging with the two sloping surfaces 24, the revolving movement of the shutter will be accompanied by further inward movement of the shutter, so that the compression spring is still further compressed.

The withdrawal of the plug pins permits the helical spring 22 to expand and return the shutter to its screening position; this movement starting with rotation and axial movement of the shutter while the abutments 25 move down the sloping faces 24, back to the ends of these sloping faces, after which the revolving movement will cease and the shutter move axially only until the projections re-enter the openings 13 under the continued expansion of the spring.

On the insertion of one plug pin only, or one pin like object or finger into one opening 13, the shutter tilts sideways and cannot revolve because of the obstruction of one or other of the projections 15 and 16 in its opening. Simultaneously an annular shoulder 26 on the projection 19, which is moved sideways off its normal revolving axis, engages a conical side wall 27 of the entrance of well 20 and prevents further inward movement of the shutter. On this sideways tilting the edge of pin 17 engages the edge of recess 18 and also obstructs further movement. As seen in Figure 3, even in the fully tilted position the projection 16 which is pushed is still partially located in its opening 13. The pin 17 ensures that the shutter will always return to its revolving axis and the projections fully into their openings after such sideways movement.

Although the socket outlet has been described as having two contacts only, an earthing contact may be provided which has no association with the shutter.

Attention is directed to our copending Application No. 20038/70 (Serial No. 1210360).

WHAT WE CLAIM IS:—

1. An electrical socket-outlet having two socket contacts for connection with two pin contacts of a plug, the socket-outlet having an insulating casing the front wall of which defines two openings for receiving the contact pins, a shutter rotatably mounted in the socket-outlet and having a pair of forwardly extend-

ing projections which in the screening position of the shutter extend into the openings, the shutter being axially movable away from the openings by a push on both projections, means for preventing such axial movement of the shutter in response to a push on one projection only, means for causing the shutter to rotate in response to a push on both projections after it has moved through a predetermined distance away from the front wall and means for urging the shutter to its screening position.

2. A socket-outlet according to claim 1 in which the means for causing the shutter to rotate is provided by the front surfaces of the projections being sloped such that a push on the front surfaces tends to rotate the shutter.

3. A socket-outlet according to claim 1 or claim 2 in which the predetermined distance substantially corresponds to the length by which the projections extend into the openings in the screening position.

4. A socket-outlet according to any of claims 1 to 3 in which the shutter is formed with abutments arranged in the screening position to engage side surfaces of abutments on the back surface of the wall, the depth of the abutted surface on the wall being substantially equal to said predetermined distance.

5. A socket-outlet according to any of claims 1 to 4 including means arranged to move the shutter further axially away from the front wall as it rotates.

6. A socket-outlet according to claim 5 as dependent on claim 4 in which back surfaces of the abutments on the wall slope away from the front surface in the direction of rotation of the shutter from its screening position such that engagement of the shutter abutments with the sloping surfaces during rotation of the shutter causes said shutter movement further away from the front wall.

7. A socket-outlet according to any of claims 1 to 6 in which the shutter is mounted on the wall by means of a co-operating pin and recess arranged axially of the shutter.

8. A socket-outlet according to any of claims 1 to 7 in which the mounting for the shutter is such that a push on one projection causes the shutter to tilt and including means limiting the degree by which the shutter can tilt such that in the tilted position both projections extend at least partially into the openings.

9. A socket-outlet according to claim 8 together with claim 7 in which the tilting movement is limited by engagement between the pin and the recess.

10. A socket-outlet according to any of claims 1 to 9 in which the means for urging the shutter to the screening position comprises a spring arranged to urge the shutter towards the front wall.

11. A socket-outlet according to claim 10 in which the shutter has a projection extending backwardly from its rear face into a cavity



and by engagement of abutments 25 (Figure 4) on the shutter with the straight sided wall parts 25A (Figure 1) of the abutments 23. When two pins are inserted into the openings 5 and pushed towards the back of the socket, the shutter is moved axially away from the front face of the casing until the projections 15, 16 are clear of the openings 13 and the abutments 25 are clear of the wall parts 25A. 10 This axial movement is against the pressure of the spring 22. When the projections are clear of the openings, the shutter begins to rotate due to the reaction of the ends of the plug pins with the sloping faces of the projections. By means of the two abutments 25 on 15 the shutter now engaging with the two sloping surfaces 24, the revolving movement of the shutter will be accompanied by further inward movement of the shutter, so that the compression spring is still further compressed. 20

The withdrawal of the plug pins permits the helical spring 22 to expand and return the shutter to its screening position; this movement starting with rotation and axial movement of the shutter while the abutments 25 25 move down the sloping faces 24, back to the ends of these sloping faces, after which the revolving movement will cease and the shutter move axially only until the projections re-enter the openings 13 under the continued expansion of the spring. 30

On the insertion of one plug pin only, or one pin like object or finger into one opening 13, the shutter tilts sideways and cannot revolve because of the obstruction of one or other of the projections 15 and 16 in its opening. Simultaneously an annular shoulder 26 on the projection 19, which is moved sideways off its normal revolving axis, engages a conical side wall 27 of the entrance of well 20 and prevents further inward movement of the shutter. On this sideways tilting the edge of pin 17 engages the edge of recess 18 and also obstructs further movement. As seen in Figure 3, even in the 45 fully tilted position the projection 16 which is pushed is still partially located in its opening 13. The pin 17 ensures that the shutter will always return to its revolving axis and the projections fully into their openings after such sideways movement. 50

Although the socket outlet has been described as having two contacts only, an earthing contact may be provided which has no association with the shutter.

55 Attention is directed to our copending Application No. 20038/70 (Serial No. 1210360).

WHAT WE CLAIM IS:—

1. An electrical socket-outlet having two socket contacts for connection with two pin 60 contacts of a plug, the socket-outlet having an insulating casing the front wall of which defines two openings for receiving the contact pins, a shutter rotatably mounted in the socket-outlet and having a pair of forwardly extend-

ing projections which in the screening position of the shutter extend into the openings, the shutter being axially movable away from the openings by a push on both projections, means for preventing such axial movement of the shutter in response to a push on one projection 70 only, means for causing the shutter to rotate in response to a push on both projections after it has moved through a predetermined distance away from the front wall and means for urging the shutter to its screening position. 75

2. A socket-outlet according to claim 1 in which the means for causing the shutter to rotate is provided by the front surfaces of the projections being sloped such that a push on the front surfaces tends to rotate the shutter. 80

3. A socket-outlet according to claim 1 or claim 2 in which the predetermined distance substantially corresponds to the length by which the projections extend into the openings in the screening position. 85

4. A socket-outlet according to any of claims 1 to 3 in which the shutter is formed with abutments arranged in the screening position to engage side surfaces of abutments on the back surface of the wall, the depth of the abutted surface on the wall being substantially equal to said predetermined distance. 90

5. A socket-outlet according to any of claims 1 to 4 including means arranged to move the shutter further axially away from the front wall as it rotates. 95

6. A socket-outlet according to claim 5 as dependent on claim 4 in which back surfaces of the abutments on the wall slope away from the front surface in the direction of rotation of the shutter from its screening position such that engagement of the shutter abutments with the sloping surfaces during rotation of the shutter causes said shutter movement further away from the front wall. 100

7. A socket-outlet according to any of claims 1 to 6 in which the shutter is mounted on the wall by means of a co-operating pin and recess arranged axially of the shutter. 105

8. A socket-outlet according to any of claims 1 to 7 in which the mounting for the shutter is such that a push on one projection causes the shutter to tilt and including means limiting the degree by which the shutter can tilt such that in the tilted position both projections extend at least partially into the openings. 110

9. A socket-outlet according to claim 8 together with claim 7 in which the tilting movement is limited by engagement between the pin and the recess. 115

10. A socket-outlet according to any of claims 1 to 9 in which the means for urging the shutter to the screening position comprises a spring arranged to urge the shutter towards the front wall. 120

11. A socket-outlet according to claim 10 in which the shutter has a projection extending backwardly from its rear face into a cavity 125



defined in the casing, the spring being located within the cavity compressed between the projection and the casing.

- 5 12. A socket-outlet according to claim 11 together with claim 8 in which the tilting movement is limited by engagement between the projection on the back of the shutter and the wall of the cavity in the casing.

- 10 13. A socket-outlet according to claim 10 or any claim dependent thereon together with claim 5, in which the further shutter movement

away from the front wall as it rotates compresses the spring.

14. A socket-outlet substantially as described herein with reference to the accompanying drawings. 15

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