The feed screw mechanism **21** is composed of a male screw **21**a formed on the shaft **19** of the stepper motor **20**, and a female screw **21**b formed in the linear cam **16**, and can convert a rotary motion of the stepper motor **20** into a linear motion of the linear cam **16** by a predetermined lead.

The reset means **22** consists of a butting surface **14***c* (stopper means) of the inner surface of the casing **14** located to block the course of the linear cam **16**.

When the linear cam **16** is moved forward and placed into a reference position, where the pins **11** display reference binary information, that is, a position indicated by a chain line in FIG. **1**, the butting surface **14***c* butts against a front end surface **16***a* of the linear cam **16** to stop further advance of the linear cam **16**. Thereby, even if the stepper motor **20** is driven in response to a drive command signal applied thereto, the linear cam **16** butts against the butting surface **14***c* and is held in a stop state, and then, the shaft **19** is also held in a stop state through the feed screw mechanism **21**. Therefore, the stepper motor **20** is stepped out until the drive command signal ends, and forcibly set in the original position at the completion of the drive command signal.

Accordingly to the binary information display device **10** having such structure, when a drive command signal is applied to the stepper motor **20** as a component of the linear movement mechanism **17** and the shaft **19** is rotated in response to the drive command signal, the linear cam **16** is moved linearly in accordance with the lead of the feed screw mechanism **21**. Since the linear cam **16** is provided with the uneven surface **18** located in contact with the bottom ends **11***a* of the pins **11**, the pins **11** are shifted vertically in accordance with ups and downs on the uneven surface **18**. As a result, the top ends **11***b* of the pins **11** are extruded from and retracted into the display surface **12***a* according to a layout pattern of the projections **18***a* and the recesses **18***b* on the uneven surface **18**, thereby displaying four bits of binary information.

For example, the binary information display device **10** shown in FIG. **1** is displaying four bits of binary information "0100" form the left of FIG. **1**. Furthermore, when the linear cam **16** is linearly moved only by one pitch of layout of the projections **18***a* and the recesses **18***b* by making the shaft **19** of the stepper motor **20** to make a plurality of rotations, by which binary information "0001" is displayed as shown in FIG. **2**.

In this case since the binary information display device **10** of this embodiment adopts the linear cam **16** and converts the rotary motion of the stepper motor **20** into the linear motion of the linear cam **16** by the feed screw mechanism **21**, binary information does not need to be displayed in a plurality of patterns during one rotation of the motor **6**, as distinct from before. Therefore, setting can be made such that the pattern of binary information is changed by, for example, a plurality of rotations of the shaft **19** of the stepper motor **20**.

As a result, since the error in shape of the uneven surface **18** of the linear cam **16** is prevented from being sensitively reflected in binary information, the linear cam **16** is not required to be worked with high accuracy, and the number of manhours for working and the piece rate can be reduced. If the amount of binary information to be displayed increases, it is only necessary to increase the length of the linear cam **16**. There is no need to increase the outside dimension of the cam **5** as in the conventional cylindrical cam **5**. Accordingly, downsizing of the device can be achieved by reducing the size of the cam **5** in the crosswise direction.

In addition, since the stepper motor **20** is adopted, the applied voltage is relatively low and a complicated high-voltage circuit needed in use of bimetal is unnecessary, by which downsizing of the whole binary information display device **10** can be achieved.

In this embodiment, since the butting surface **14***c*, which retains the front end surface **16***a* of the linear cam **16** in contact therewith, is adopted as the reset means **22** for setting the original position of the stepper motor **20**, the original position can be reset with reliability by a simple structure. As a result, accurate binary information can be displayed.

The setting of the original position of the stepper motor **20** is made as needed, more specifically, at power-on and the like. The setting in such cases, for example, at power-on, may be made when a power switch is turned on, or when a reset switch is operated in other cases.

This operation for setting the original position of the stepper motor **20** may be carried out in response to the application of a drive command signal, which allows the linear cam **16** to move toward the butting surface **14***c* by a distance at least corresponding to the entire operating distance, to the stepper motor **20** so that the setting is made reliably wherever the linear cam **16** is positioned.

According to the binary information display device **10** of this embodiment, since there is no need to mount an expensive and complicated detecting means, such as a rotational position detector for detecting the rotation angle of the stepper motor **20**, it is possible to provide an inexpensive device which makes the most of the advantages of the stepper motor **20** in its capability to achieve simple and high-precision control.

Next, a second embodiment of a binary information display device according to the present invention will be described with reference to FIGS. **3** and **4**.

In this embodiment, components common to the aforesaid first embodiment are denoted by the same numerals, and the description thereof is simplified.

This embodiment uses the above-mentioned binary information display device **10** as a braille display device **30**. As shown in FIG. **3**, a unit **31** for driving four parallel rows of pins **11**, totalling to eight, displays one braille letter.

In other words, the braille display device **30** according to this embodiment comprises eight pins **11** arranged in two rows, a support member **12** for supporting the pins **11** slidably in the vertical direction, and two drive mechanism **13** located for the respective rows to move the pins **11** upward or downward. The drive mechanism **13** has a structure similar to that of the above-mentioned binary information display device **10**.

Two stepper motors **20** composing the respective drive mechanisms **13** are laid to be shifted from each other in the vertical direction and to overlap in the crosswise direction so that the width of the unit **31** itself is as small as possible. In FIG. **4**, a female screw hole **32** is formed on a linear cam **16** for commonality of components, a fixing substrate **33** fixes the stepper motor **20** to a casing **14**, and a positioning projection **34** positions casings when braille display devices are located adjacent to one another as shown in FIG. **4**.

According to the braille display device **30** thus structured, when two linear cams **16** are individually moved linearly by driving the stepper motors **20**, the pins **11** are protruded from a display surface **12***a* row by row to display one braille letter. At power-on or the like, the original positions of the stepper motors **20** are set precisely by the actuation of a reset means **22** similarly to the binary information display device **10** in the first embodiment, and a correct braille letter corresponding to a drive command signal can be displayed.