The present invention relates to a sound installation, in particular a stereophonic sound installation, for televisions with an integrated low-frequency loudspeaker of large dimensions.

Current aesthetic considerations regarding televisions, in particular televisions with almost flat screens of large dimensions, impose cabinets having, on each side of the cathode ray tube, "sound columns" of very small width. Now, it is known that, in order to reproduce the low frequencies of the sound spectrum correctly, it is necessary to use loudspeakers of large dimensions, preferably circular or elliptical loudspeakers. Such loudspeakers cannot be housed in these narrow sound columns. Currently, the problem is solved either by using bass loudspeakers which are too small or of very elongate shape, or by connecting external loudspeakers placed in baffles independent of the television. For stereophonic reproduction, it is therefore necessary to use two such baffles.

A sound installation for a television, including a bass loudspeaker housed in an acoustic chamber, is known from the document EP-A-0,117,487, but this chamber opens out towards the rear of the television.

The subject of the present invention is a sound installation, in particular a stereophonic sound installation for a television, using a loudspeaker for reproducing the low frequencies, of large dimensions, which is placed in the cabinet of the television.

The sound installation according to the invention includes, in addition to the loudspeakers for reproducing the high frequencies of the sound spectrum, which are normally fixed to the front panel of the television, at least one loudspeaker for reproducing the low frequencies, which is placed in the cabinet of the television, at its rear part, and associated with a chamber separate from the cabinet and opening out on one side of the front panel of the television, the front part of this chamber being much narrower than its rear part. Preferably, this chamber is lined with a sound-absorbing substance, such

as glass wool. Advantageously, the rear cover and the inner surfaces of the cabinet which are not occupied by the chamber are lined with a sound-absorbing substance.

The present invention will be better understood on reading the detailed description of two embodiments, given by way of non-limiting examples and illustrated by the attached drawing, in which:

- Figure 1 is a front view of a television in accordance with the invention, without the front-panel decoration grilles,

- Figure 2 is a plan view in section along II-II of Figure 1, and

- Figure 3 is a view, similar to that of Figure 2, of another embodiment of a television in accordance with the invention.

The television shown in the drawing is of the type having a cabinet which includes, on the front panel 1, two "sound columns" 2, 3 extending over the entire height of the front panel and over a small width of approximately 10 cm. In current televisions of known type, the front panel includes, for each sound column, a cut-out for a loudspeaker for reproducing the treble frequencies (known by the name of "tweeter") and a loudspeaker for the reproduction of the low frequencies and mid-range frequencies of the sound spectrum. On account of the very small width of the columns, the base and mid-range loudspeaker can only be of mediocre quality.

The sound installation of the invention includes a loudspeaker 4 of large dimensions (for example of a diameter of at least 10 cm) capable of reproducing correctly, in particular, the low frequencies of the sound spectrum (from approximately 30 Hz). This loudspeaker 4 is fixed in the rear part of the cabinet 5 of the television.

According to the embodiment shown in Figure 2, the loudspeaker 4 is fixed at the rear of a sound chamber 6, roughly at mid-height of the television. This chamber 6 is made of a material currently used for making sound

chambers, such as wood chipboard or filled plastic, of suitable thickness (at least approximately 10 mm in thickness). The chamber 6 extends over nearly the entire height of the cabinet of the television. Its shape is adapted to the space existing between the cathode ray tube 7 and one of the walls of the cabinet 5. In the drawing, the chamber is placed in the right-hand part of the cabinet but, of course, it could equally well be in the left-hand part.

At the front part of the cabinet 5, the chamber 6 has a small width defined by the width of the sound columns 2 or 3, while on the contrary, at the rear, the chamber 6 extends over almost half the width of the rear part of the cabinet. Between the front and rear, the profile of the chamber 6 is defined by the shape of the cabinet 5 and of the cathode ray tube 7. It is preferable that, on the cabinet side, the profile of the chamber matches that of the cabinet whereas, on the cathode ray tube side, it is at a distance from the latter of several centimetres so as not to touch it, taking into account the tolerances in the manufacture and positioning of the tube.

The rear surface 8 of the chamber can be parallel to the rear cover 9 and can be located at a sufficient distance from it in order to house the loudspeaker 4 and to allow its soundwaves to pass, this loudspeaker being fixed to this surface 8. According to the embodiment shown in the drawing, the surface 8 of the chamber makes an angle of approximately from 20 to 30° in relation to the cover 9.

According to the embodiment of Figure 2, the loudspeaker 4 is fixed to the surface 8, outside the chamber, in front of a corresponding cut-out in this surface 8. The front wave of the loudspeaker 4 therefore passes into the chamber 6 and leaves via the opening 10 made in the front panel 1 on the side of the column 3. The rear wave of the loudspeaker 4 is directed towards the opening 11 made in the front panel 1, on the side of the column 2, going around the tube 7.

The left-hand 12 and right-hand 13 treble loudspeakers, on account of their small dimensions, are fixed directly to the rear face of the front panel 1, in the columns 2 and 3. They can either be both fixed at the bottom of these columns, as shown in the right-hand part of Figure 1 (or at the top, according to an embodiment not shown) or in the middle of these columns, as shown in the left-hand part of Figure 1. In the first case, the openings 10, 11 for passage of the forward and back waves of the loudspeaker 4 are single rectangular openings for each column, extending over the entire height available above the corresponding treble loudspeaker. In the second case, the openings 10, 11 are rectangular, but in two parts extending above and below the corresponding treble loudspeaker.

The embodiment of Figure 3 is similar to that of Figure 2, the sole difference being that the bass loudspeaker 4' is fixed to the partition 8 of the chamber 6, inside this chamber.

In order to improve the acoustic qualities of the device of the invention, the chamber 6 is filled with acoustically absorbing material 14, such as glass wool. Advantageously, such an absorbing material 15 [sic] is fixed to the rear cover 9 and the inner surfaces of the cabinet 5.

The device of the invention makes it possible to obtain a stereophonic effect with a single bass loudspeaker and two treble loudspeakers, since the low frequencies of the sound spectrum are barely directional, (it is difficult to locate their source exactly) and are practically not involved in the stereophonic effect which is essentially due to the treble loudspeakers. Advantageously, if true stereophonic sources are available, it is possible to use as the loudspeaker 4 a twin-coil loudspeaker.

The invention has been described hereinabove with reference to an installation having a single bass loudspeaker but, of course, a second one of them could be used, fixed to a chamber similar to the chamber 6,

symmetrically in relation to the axis of the tube 7.

CLAIMS

1. Sound installation, for a television with an integrated low-frequency loudspeaker of large dimensions, also including treble-frequency loudspeakers fixed to the front panel of the television, characterized in that it includes at least one loudspeaker (4) for reproducing the low frequencies, which is placed in the cabinet of the television, at its rear part, and associated with a chamber (6) separate from the cabinet and opening out on one side (10) of the front panel of the television, the front part of this chamber being much narrower than its rear part.

2. Sound installation according to Claim 1, for stereophonic sound reproduction, characterized in that it includes a second chamber associated with a low-frequency loudspeaker and fixed symmetrically with respect to the first chamber.

3. Sound installation according to either of Claims 1 and 2, characterized in that the chamber is lined with sound-absorbing material (14).

4. Sound installation according to one of the preceding claims, characterized in that the rear cover (9) and the inner surfaces of the cabinet which are not occupied by the chamber are lined with sound-absorbing material.