

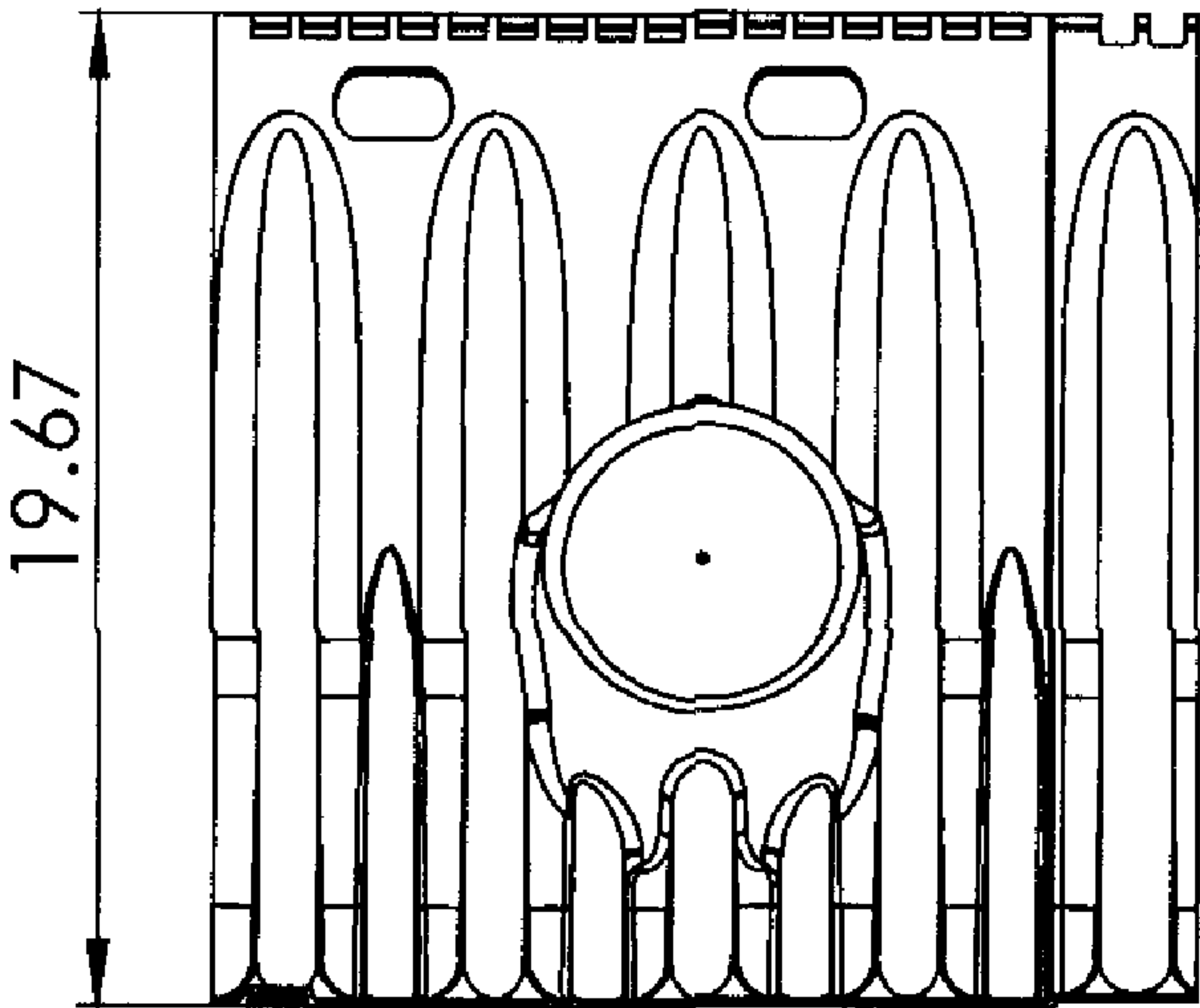


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(71) Demandeur/Applicant:
MCKECHNIE, KRIS, CA
(72) Inventeur/Inventor:
MCKECHNIE, KRIS, CA
(74) Agent: BURNET, DUCKWORTH & PALMER LLP

(54) Titre : DISPOSITIF DE CONFINEMENT DE FLUIDE
(54) Title: FLUID CONTAINMENT DEVICE



(57) **Abrégé/Abstract:**
A containment basin comprising a plurality of interlocking modular panels, wherein said modular panel are free-standing. The interlocking modular panel for use in a containment basin, comprise: a base section; and a side section; wherein said base section panel and side section panel being fixedly connected to one another at an edge and comprising a plurality of rib elements bridging the side section and base section.

ABSTRACT

A containment basin comprising a plurality of interlocking modular panels, wherein said modular panel are free-standing. The interlocking modular panel for use in a containment basin, comprise: a base section; and a side section; wherein said base section panel and side section panel being fixedly connected to one another at an edge and comprising a plurality of rib elements bridging the side section and base section.

FLUID CONTAINMENT DEVICE

FIELD OF THE INVENTION

This invention relates to fluid containment device, more specifically a fluid containment device which is free-standing to be used in oil and gas operations.

BACKGROUND OF THE INVENTION

Environmental issues abound in the oil and gas industry. A recurring concern for all stakeholders involved in this industry is the issue of spill containment. Containment basins have been developed as safeguards in the oil and gas industry between storage/operations and the environment. Current regulations in the industry require that storage operations provide secondary fluid containment because of environmental considerations.

Several types of containment basins have been developed and are being marketed in the industry. Typically, these containment basins consist of a plurality of wall sections arranged in a closed perimeter encircling an oil/gas storage unit. The wall sections are placed on an leveled surface and held in place by post, supports legs, tension cables, or the like. The interior section is typically covered with an impermeable plastic cover where the thickness varies. The plastic cover is then covered by sand, gravel or the like. The following prior art represents some of these devices.

US Patent no. 6,053,666 discloses an extruded containment barrier panel (5) for use in forming a containment barrier wall about a waste material storage or disposal site is disclosed. The containment barrier panel has an elongate body panel (10) with a top end (11), a spaced bottom end (12), and a first side edge (14) and a spaced parallel second side edge (15) extending from the top end to the bottom end of the body panel. A C-shaped female connecting member (17) is formed along the first side edge of the body panel, and a complimentary male connecting member (22) is formed along the second side edge of the body panel, both of which extend the length of the body panel. The male connecting member is sized and shaped to be slidably received within a second one of the female connecting members for forming an interlocked edge-standing relationship with a second one of the barrier panels, and both of the male and female connecting members may be rotated with respect to one another when one of the containment barrier panels is being joined to a second adjacent one of the containment barrier panels to form a containment barrier wall. The male connecting member has least two elongate seal members (32, 33, 34) extending the length thereof, and constructed and arranged to be placed into sealing engagement with the female connecting member of the second barrier panel such that a fluid-tight seal will be formed between adjacent ones of the

barrier panels for preventing the migration of groundwater and/or underground gases from out or into the waste material storage or burial site.

US patent no. 4,917,543 A teaches wall systems which employ a plurality of individual panels formed of extruded polymeric material joined in edge-to-edge relation including wale members which are vertically offset and interlocked at end portions thereof with adjacent wale members. The wall systems include connector elements for joining and interlocking the adjacent panel edges, and panels are disclosed, each having a continuous convex surface between their opposite side edges and strengthening ribs formed on a concave surface disposed opposite the convex surface thereof. A revetment system is disclosed in which a pair of wall sections are positioned in facing spaced-apart relation and joined by tie bolts extending through the wale members, to receive concrete therebetween.

Despite the known devices in the prior art, there still exists a need for strong yet easier to install containment basin which provide similar or better containment performance but allow for substantially decreased installation costs. The inventor has developed a novel modular panel system for use in containment basin which has eliminated the need/ requirement for posts, support legs or the like in the installation process.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided a containment basin comprising a plurality of interlocking modular panels, wherein said modular panel are free-standing.

According to another aspect of the present invention, there is provided an interlocking modular panel for use in a containment basin, wherein said modular panel comprises:

- a base section; and
- a side section;

wherein said base section panel and side section panel being fixedly connected to one another at an edge and comprising a plurality of rib elements bridging the side section and base section.

Preferably, each of one said plurality of ribs extends from said side section down to the base section. Preferably also, each one of said plurality of ribs being substantially perpendicular to the edge defined by the side section and base section. According to a preferred embodiment, each one of said plurality of ribs having an inward arcuate shape and each one of said plurality of ribs extending from a distance Y from the

edge on the side section down to a distance X from the edge on the base section. Preferably, the length of distance Y is substantially equal to the length of distance X.

According to a preferred embodiment, the interlocking modular panel further comprises a plurality of shorter ribs, wherein each one of the plurality of shorter ribs is positioned between two adjacent rib elements in an alternating pattern. Preferably, each one of said plurality of shorter ribs having an inward arcuate shape and each one of said plurality of shorter ribs extending from a distance Y2 from the edge on the side section down to a distance X2 from the edge on the base section. Also preferably, the length of distance Y2 is substantially equal to the length of distance X2.

According to another aspect of the present invention, there is provided a containment basin comprising a plurality of interlocking modular panels forming a perimeter around a storage tank wherein said each one of said modular panels comprising:

- a base section having an inside edge and an outside edge and two side edges; and
- a side section having a top edge and a bottom edge and two side edges;

wherein said base section and side section being fixedly connected to one another at the bottom edge of the side section and the outside edge of the base section and comprising a plurality of rib elements bridging the side section and base section.

Preferably, the basin comprising straight modular panels and corner modular panels. Also preferably, each one of said rib elements having a hollow back portion to allow for the interlocking of two panels together.

According to another aspect of the present invention, there is provided a containment basin comprising an access port is located on the side section of the modular panel, said access port adapted to allow the removal of material located inside the containment basin. Preferably, the access port being located centrally to the side section. Also preferably, the corner modular panel having a first extremity comprising a rib adapted to be inserted into a rib of a straight modular panel.

BRIEF DESCRIPTION OF THE FIGURES

The invention may be more completely understood in consideration of the following description of various embodiments of the invention in connection with the accompanying figures, in which:

Figure 1 is a front view of a modular panel according to a preferred embodiment of the present invention;

Figure 2 is a side view of a modular panel according to a preferred embodiment of the present invention;

Figure 3 is a perspective view of a modular panel according to a preferred embodiment of the present invention;

Figure 4 is a back view of a modular panel corner piece according to a preferred embodiment of the present invention;

Figure 5 is a top view of a modular panel corner piece according to a preferred embodiment of the present invention;

Figure 6 is a perspective view of a modular panel corner piece according to a preferred embodiment of the present invention;

Figure 7 is a perspective view of a containment basin comprising modular panels according to a preferred embodiment of the present invention;

Figure 8 is a top view of a containment basin comprising modular panels according to a preferred embodiment of the present invention;

Figure 9 is a side view of a containment basin comprising modular panels according to a preferred embodiment of the present invention;

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

A containment basin according to a preferred embodiment of the present invention as illustrated in Figures 7, 8 and 9 depict a modular panel based-containment basin which requires no hand tools or mechanical devices to be used for the installation thereof. The design is based on a parallelogram centralizing the load to keep the centre of gravity low. The strength of the structure was designed into the panel construction to keep the panels in place with the load of the fluid as well as the block design holds each panel to the other panel. The metal top ring ties the top of the panels together and is an integral part of the design. Once the system is installed the structure is entirely free standing and requires no additional support legs, bolts, tension wires or cables. The block design and hydrostatic pressure holds the system firmly in place. The rigidity of the panel comes from the one piece design with the support ribs milled into the panel.

This system is design to go around a tank/vessel to prevent the potential of the fluids in which were being stored in the tank/vessel from leaking and contaminating the ground or surrounding area. Inside of

the containment a plastic linear will be installed to contain the fluids. This method of linear is used on a regular basis with the competitors.

According to a preferred embodiment of the present invention, the fluid containment basin is designed out of 100% plastic and can also be made out of recycled plastic.

The shape and the design of the ribs is preferably arcuate and is based on the math of the fluid weight and pressure it exerts on the containment basin sides.

The rib elements preferably have a inwardly arcuate shape which tapers out at each extremity of the ribs. The extremities of the ribs are substantially located proximate the edge of the sections it supports (side section and base section).

Preferably, the rib elements are located along the entire length of the panel. More preferably, each one of the plurality of rib elements is positioned at an equal distance from one another along the longitudinal axis defined by the panel.

More preferably, the plurality of rib elements is comprised of larger ribs interspersed between similarly shape smaller ribs. This design allows to provide the functional strength required by the modular panel all the while decreasing the weight of the panel in comparison to a panel solely comprising larger ribs.

According to a preferred embodiment of the present invention, the modular panels do not require post, legs or separate support beams or the like to remain standing. The present invention provides for free-standing modular panels for use in a containment basin.

According to a preferred embodiment of the present invention, upon installation of a containment basin, the modular panels are laid down on a level surface in such a way as to overlap adjacent panels by inserting at least one rib element over the rib element of the previously laid modular panel. This process is repeated until the entire containment basin has been set up. Next, a layer of plastic cover is laid over the surface of the containment basin ensuring that the base section of each modular panel is fully covered and that the plastic cover goes up the side of the side sections of the modular panels. Once this step is completed, the containment is back filled with sand, gravel or a similar granular material. The weight of this granular material pushes down on the modular panels but also puts pressure on the side sections of the modular

panels. The rib elements are designed to maintain the integrity of the modular panels all the while overcoming the need to have posts or legs or the like to maintain the panels upright when the containment basin is in use.

According to a preferred embodiment of the present invention, the modular panels can have handles proximate a top edge of the side sections in order to allow a user to carry the modular panels. According to another preferred embodiment of the present invention, both the side section and bottom section are identical and the handles are found on both sections.

According to another preferred embodiment of the present invention, a containment basin kit comprises modular panels for straight pieces as shown in Figures 1, 2, and 3 as well as corner pieces as shown in Figures 4, 5, and 6. The corner sections comprise a similar design as the straight sections and have a similar rib elements pattern adapted to overlap at one end with a first straight section and at the other end with another straight section. More preferably, the corner sections comprise two pieces, a first piece which overlaps with a first straight piece at one extremity thereof and is being overlapped by a section corner piece at its other extremity. The second corner piece is then overlapped by a second straight piece, thus completing the corner.

In use, the modular panels assembled together have an overlap of a first panel with an adjacent second panel by overlapping at least one rib element from each of the adjacent panels. This interlocking feature allows for a strong, secure and removable connection between adjacent panels. The connection is made even stronger once the containment basin is filled with filling material such as sand or gravel or the like. Therefore, the present invention circumvents the need for bolts, pins, cables or anything to hold the panels of the containment basin together. Nor is there a need for legs or external supports to support the containment basin made of the modular panels according to the present invention as it is entirely free standing. The system is entirely self-supporting.

An advantage of a preferred embodiment of the present invention, is that it allows the modular panels to be packed extremely tightly as it is also lightweight.

While the foregoing invention has been described in some detail for purposes of clarity and understanding, it will be appreciated by those skilled in the relevant arts, once they have been made familiar with this disclosure that various changes in form and detail can be made without departing from the true scope of the invention in the appended claims.

CLAIMS

1. Containment basin comprising a plurality of interlocking modular panels, wherein said modular panel are free-standing.

2. An interlocking modular panel for use in a containment basin, wherein said modular panel comprises:

- a base section; and
- a side section;

wherein said base section panel and side section panel being fixedly connected to one another at an edge and comprising a plurality of rib elements bridging the side section and base section.

3. The interlocking modular panel of claim 3, wherein said each of one said plurality of ribs extends from said side section down to the base section.

4. The interlocking modular panel according to claim 2 or 3, wherein each one of said plurality of ribs being substantially perpendicular to the edge defined by the side section and base section.

5. The interlocking modular panel according to any one of claims 2 to 4, wherein each one of said plurality of ribs having an inward arcuate shape and each one of said plurality of ribs extending from a distance Y from the edge on the side section down to a distance X from the edge on the base section.

6. The interlocking modular panel according to claim 5, wherein the length of distance Y is substantially equal to the length of distance X.

7. The interlocking modular panel according to any one of claims 2 to 6, further comprising a plurality of shorter ribs, wherein each one of the plurality of shorter ribs is positioned between two adjacent rib elements in an alternating pattern.

8. The interlocking modular panel according to claim 7, wherein each one of said plurality of shorter ribs having an inward arcuate shape and each one of said plurality of shorter ribs extending from a distance Y2 from the edge on the side section down to a distance X2 from the edge on the base section.

9. The interlocking modular panel according to claim 8, wherein the length of distance Y2 is substantially equal to the length of distance X2.

10. Containment basin comprising a plurality of interlocking modular panels forming a perimeter around a storage tank wherein said each one of said modular panels comprising:

- a base section having an inside edge and an outside edge and two side edges; and
- a side section having a top edge and a bottom edge and two side edges;

wherein said base section and side section being fixedly connected to one another at the bottom edge of the side section and the outside edge of the base section and comprising a plurality of rib elements bridging the side section and base section.

11. The containment basin according to claim 10, wherein said basin comprising straight modular panels and corner modular panels.

12. The containment basin according to claim 10 or 11, wherein each one of said rib elements having a hollow back portion to allow for the interlocking of two panels together.

13. The containment basin according to any one of claims 10 to 12, further comprising an access port is located on the side section of the modular panel, said access port adapted to allow the removal of material located inside the containment basin.

14. The containment basin according to any one of claims 10 to 13, wherein said access port being located centrally to the side section.

15. The containment basin according to any one of claims 11 to 14, wherein the corner modular panel having a first extremity comprising a rib adapted to be inserted into a rib of a straight modular panel.

FIGURES

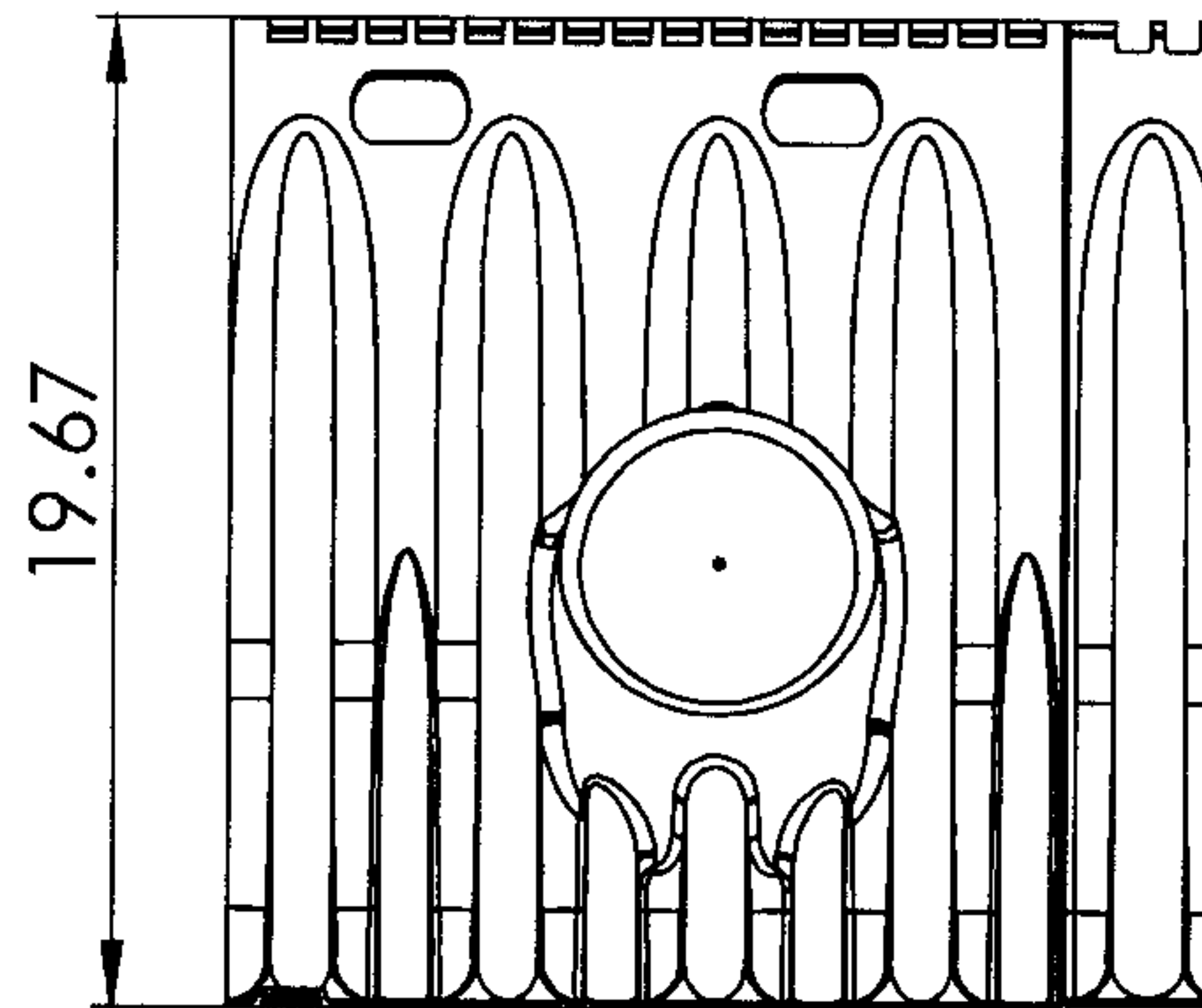


Figure 1

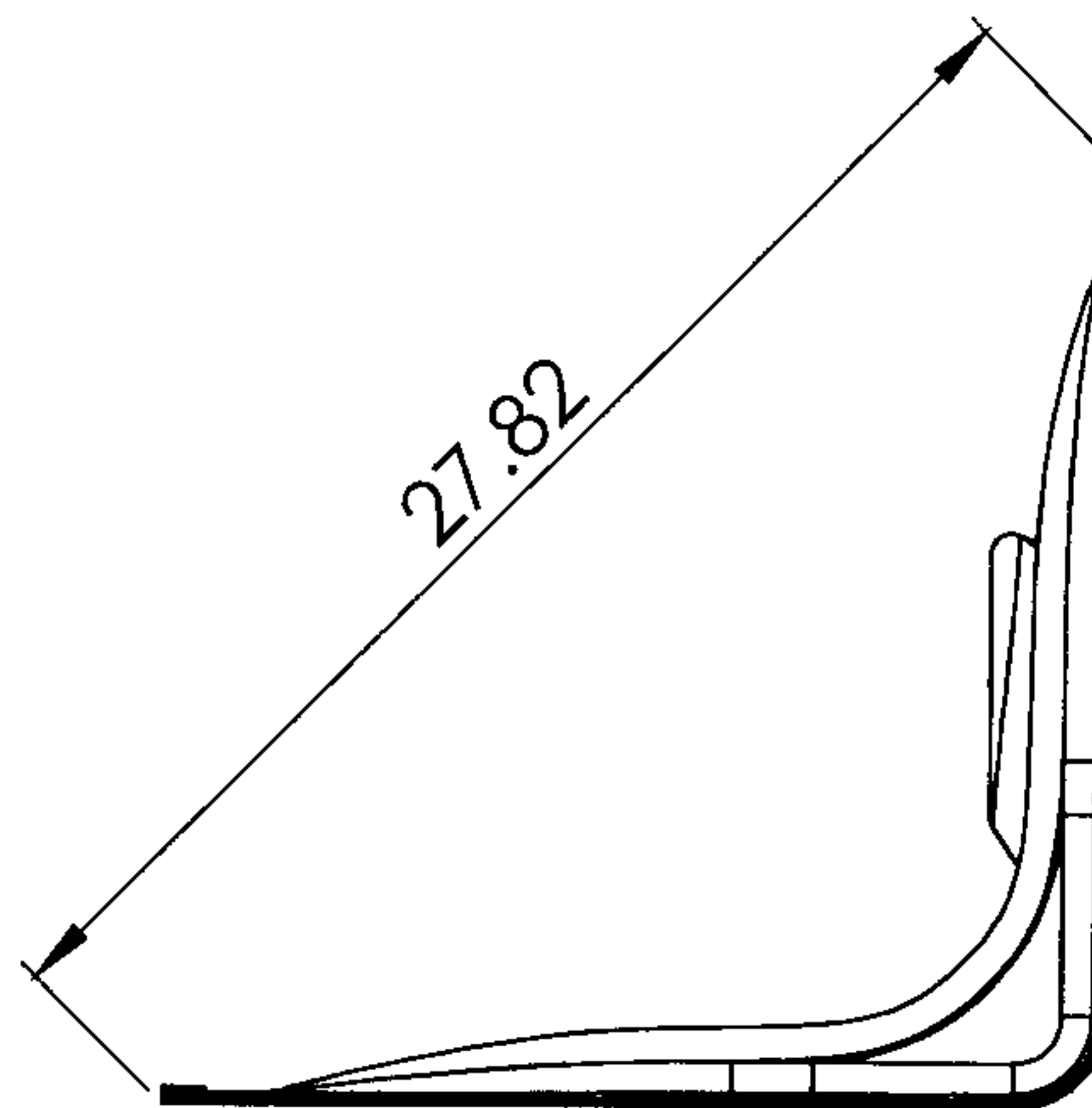


Figure 2

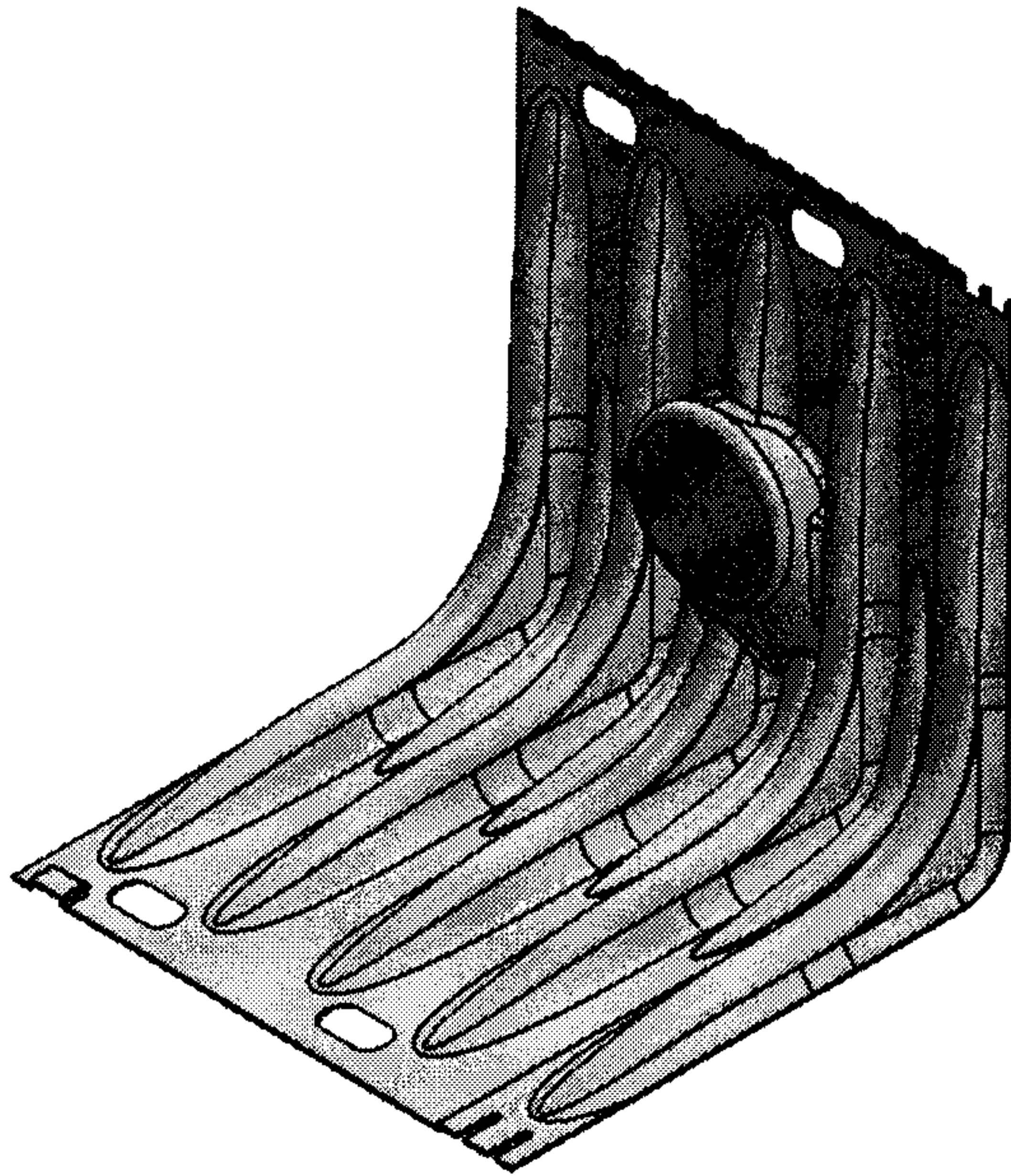


Figure 3

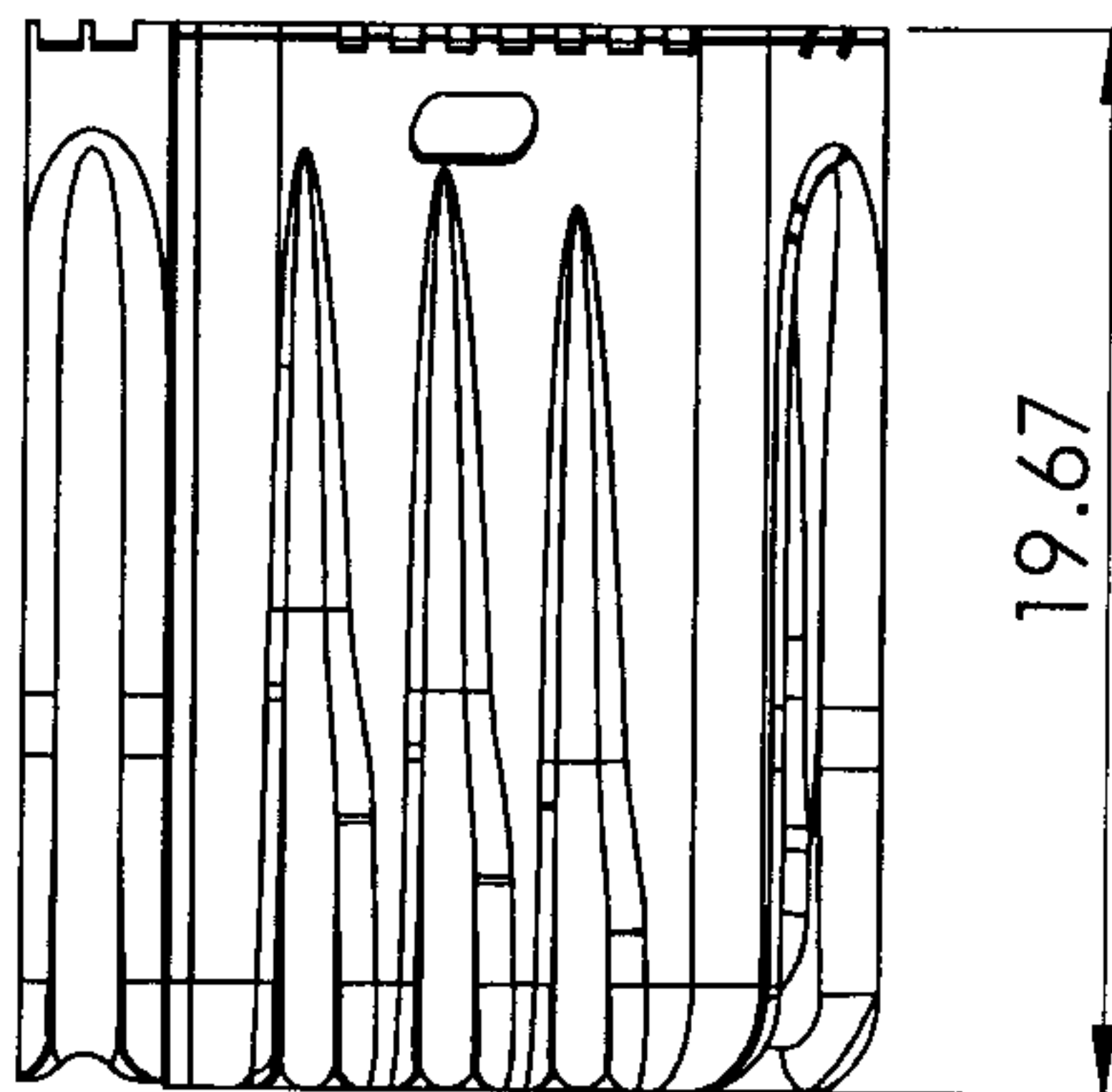


Figure 4

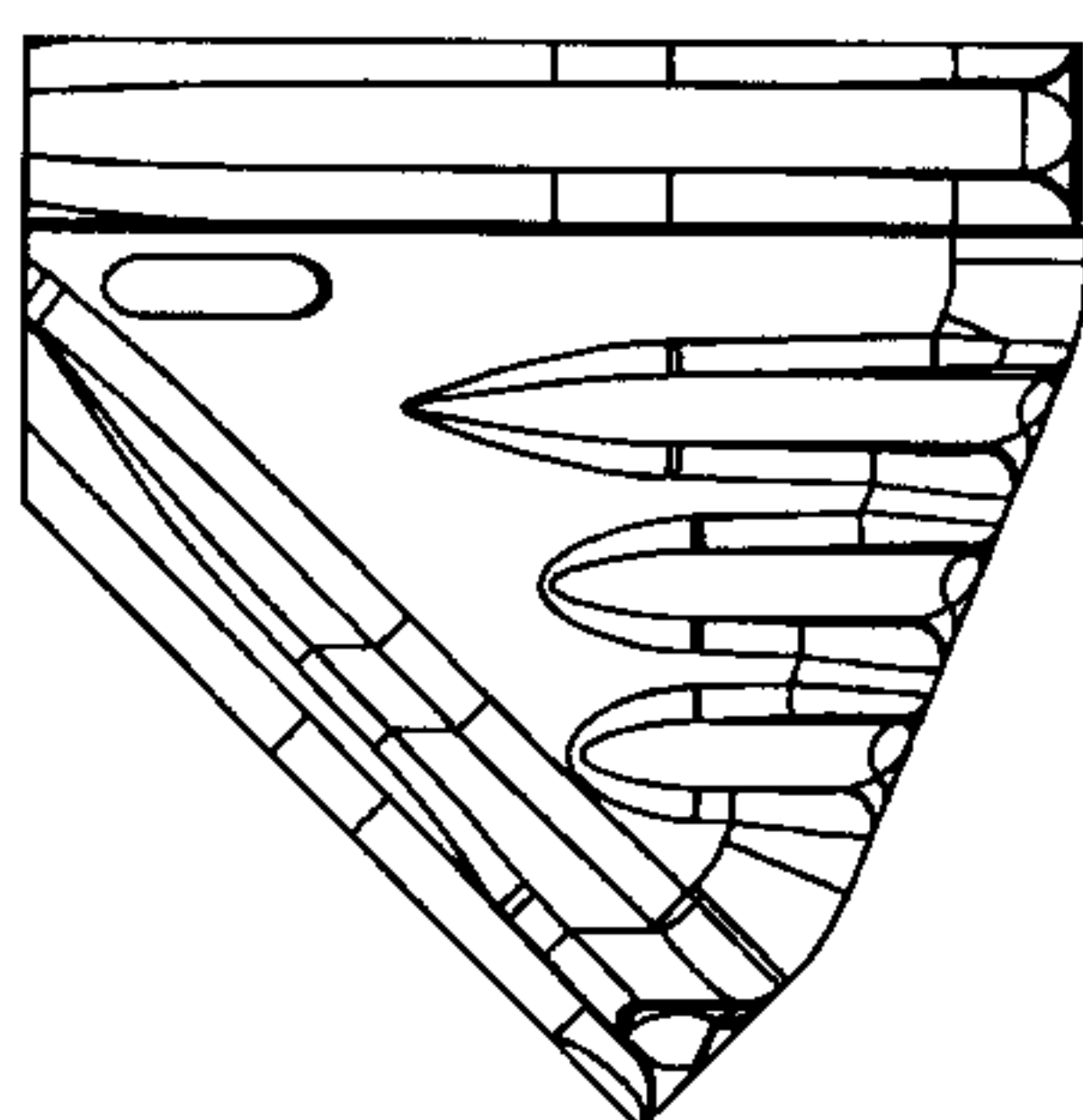


Figure 5

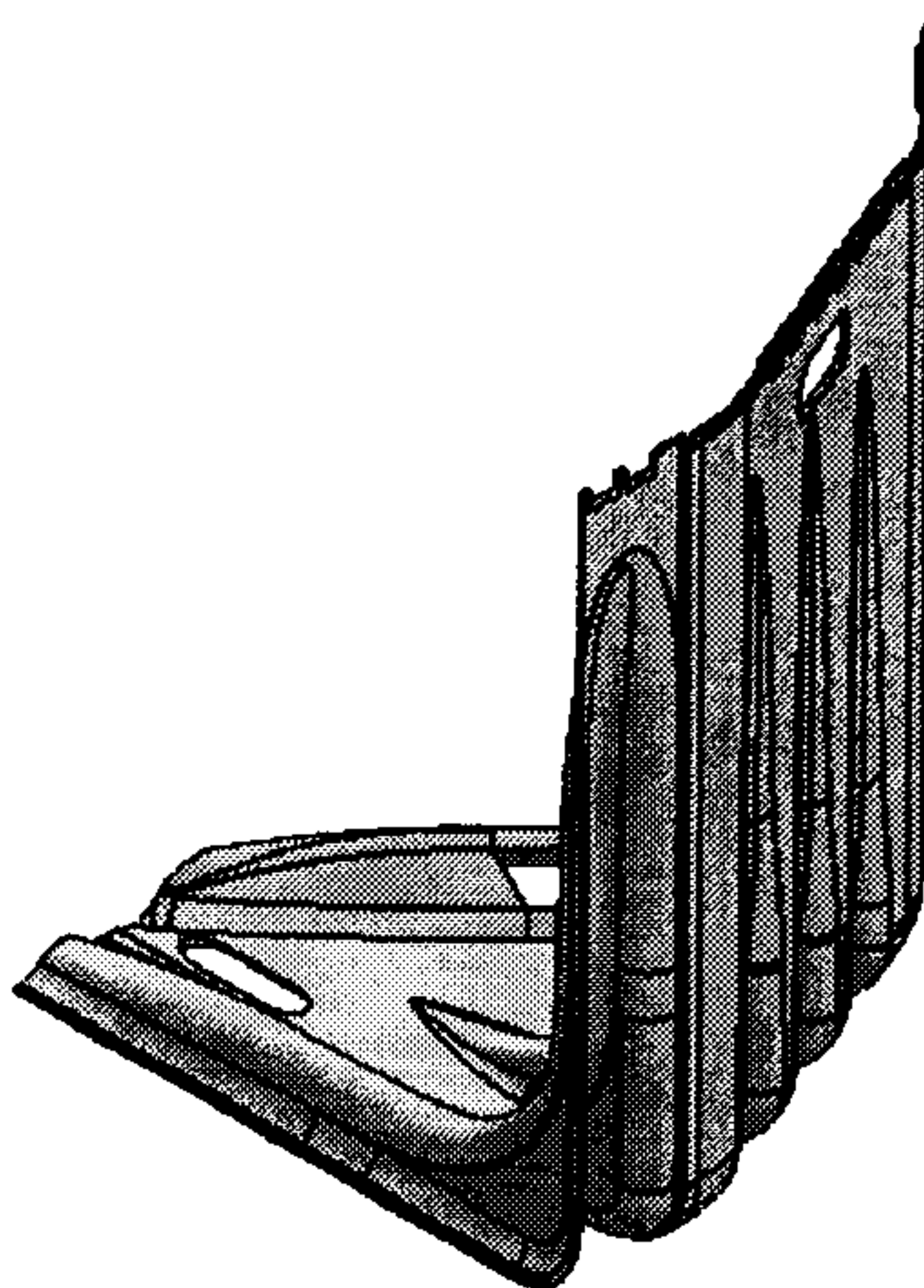


Figure 6

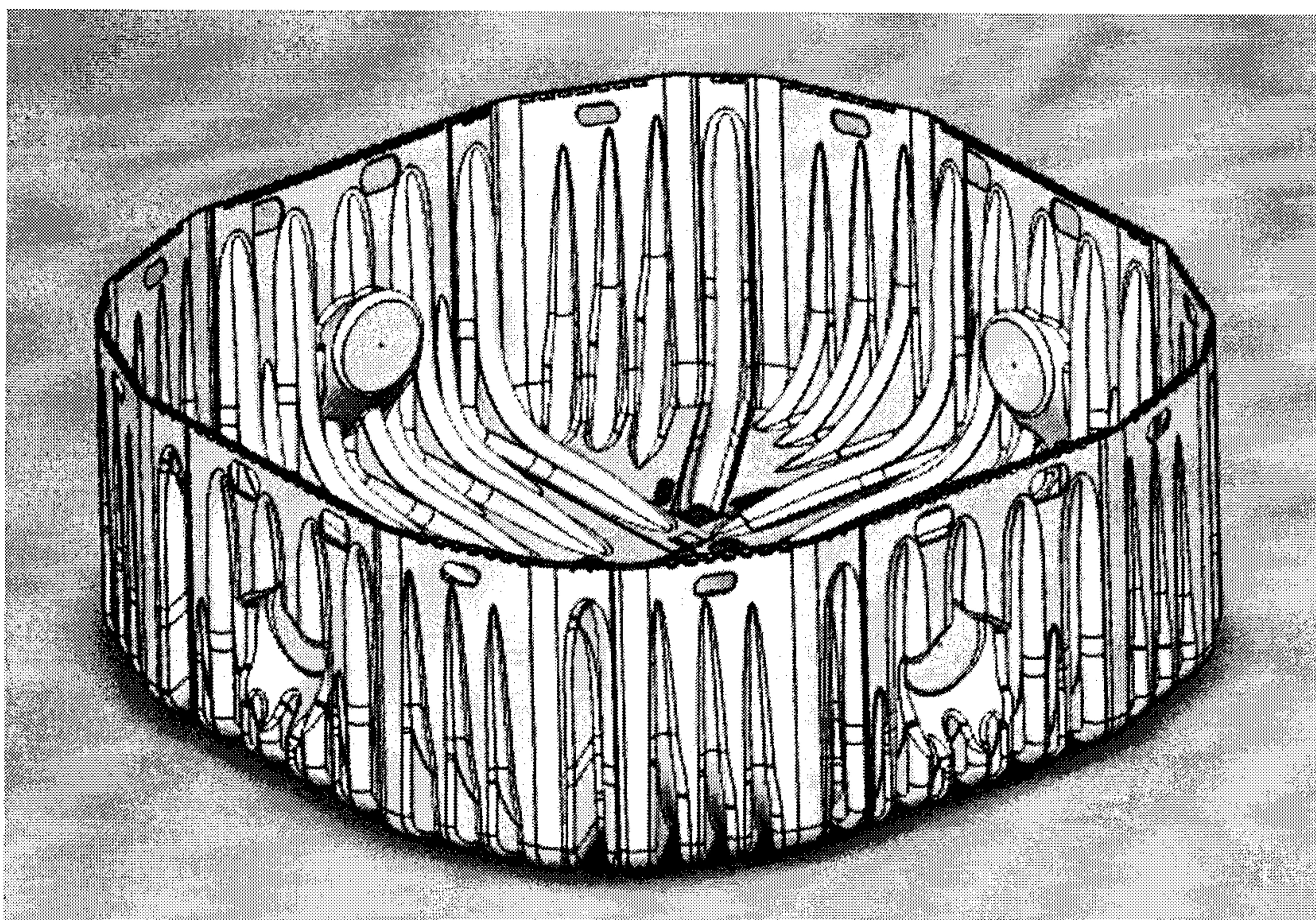


Figure 7

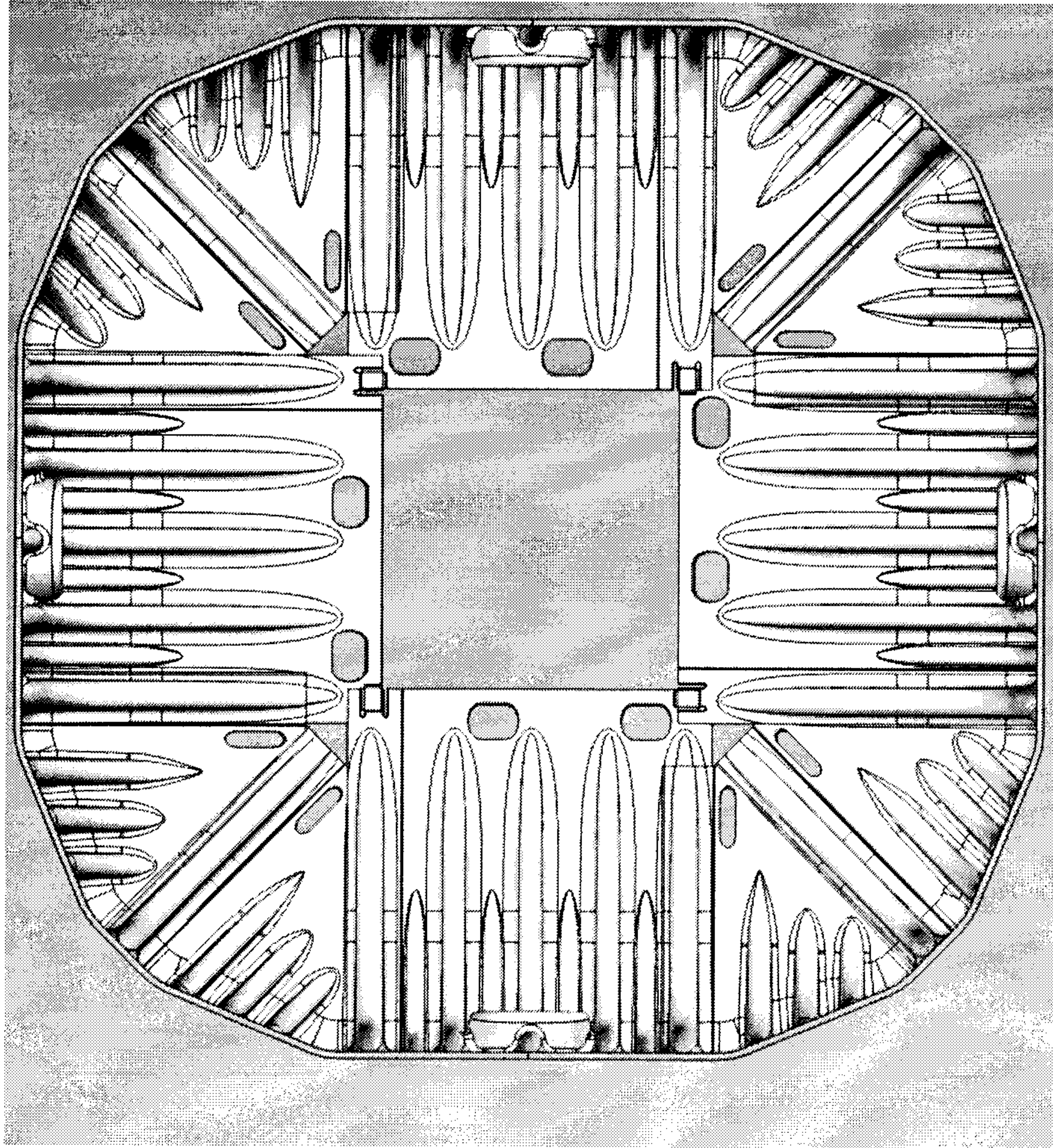


Figure 8

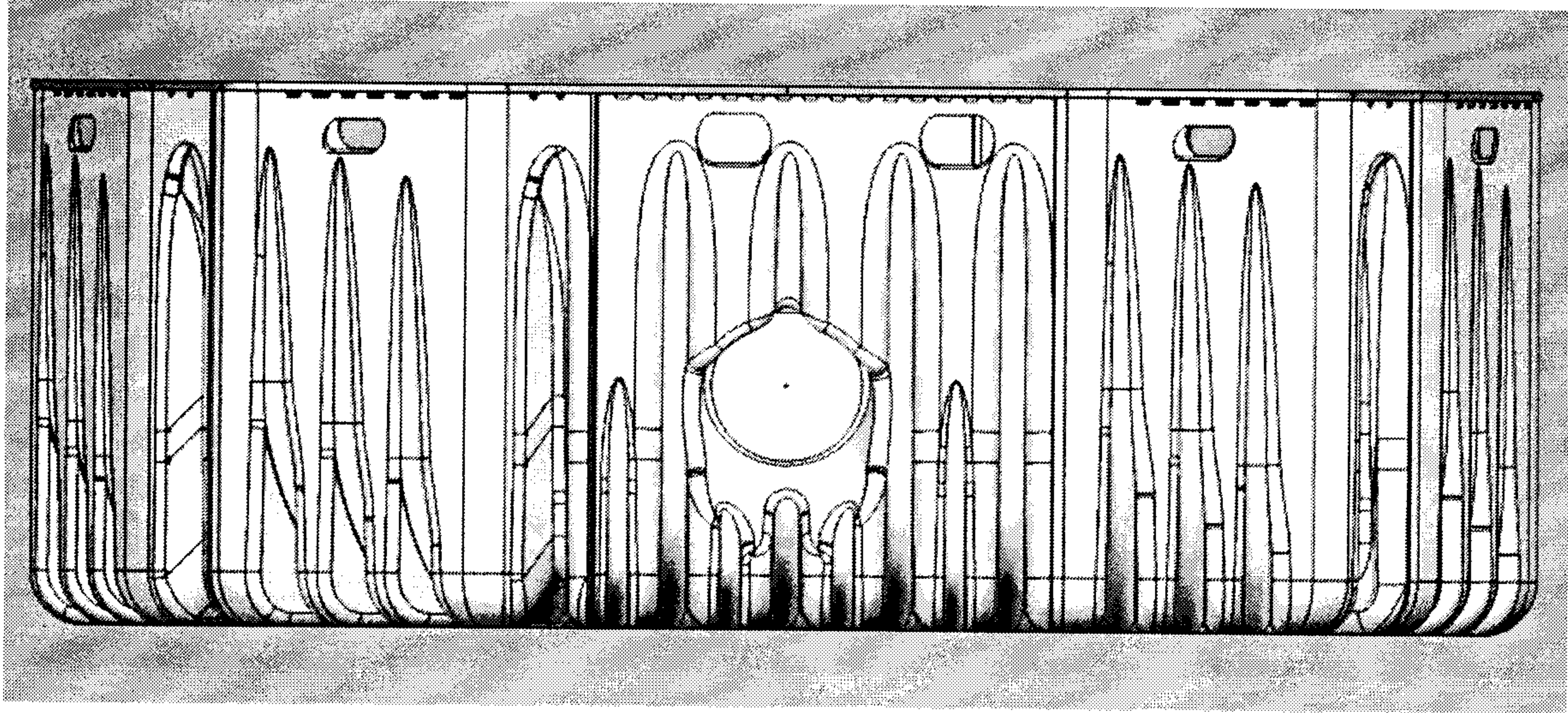


Figure 9

19.67

