

Enhance Your Business with Our Innovative Technology



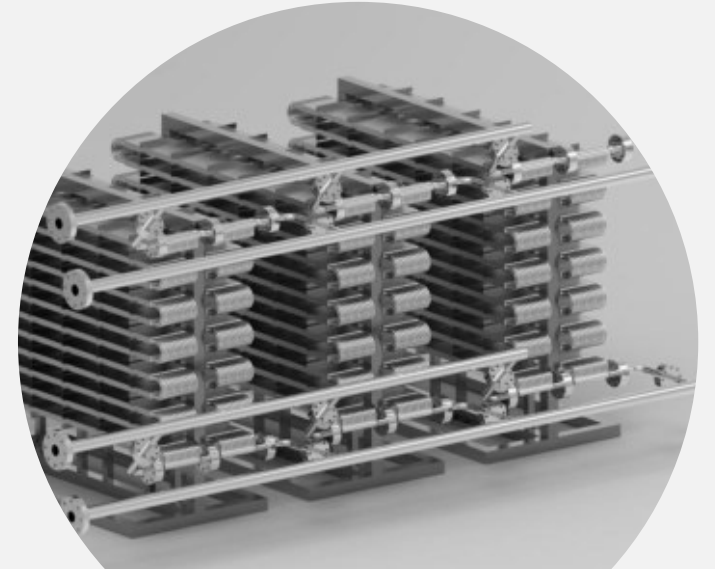
A Company of



HEAT EXCHANGER

Discover a unique opportunity to access cutting-edge patented technology, designed to revolutionize the waste treatment sector with the production of advanced biofuels

With our Heat Exchanger patent, we are ready to offer you a license that will allow you to fully exploit this innovation and dominate the market



Patent Overview

Nature of the Patent

A patent is an exclusive right granted to an invention, which prevents others from exploiting it without authorization. This is a valid legal tool to protect innovation.

Importance of the Patent

The patent ensures the owner control over the use of the invention and allows him to profit from it through the sale of licenses. It is essential to enhance and monetize innovation.

Sale of Licenses

The sale of licenses allows third parties to use the invention covered by the patent in exchange for compensation. It is an effective way to expand the market and generate additional revenue.



Patent Registration Process

Legal Protection

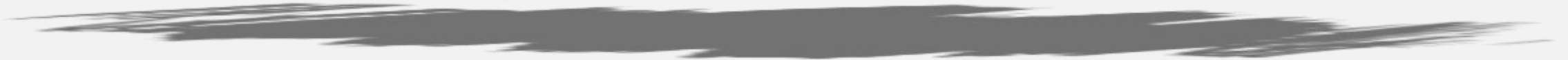
Once granted, the patent provides the owner with legal protection against unauthorized use of the invention by others. It is essential for defending intellectual property rights.

Patent application

The process begins with the submission of a patent application to the relevant Patent Office. It is essential to provide a detailed description of the invention and satisfy the patentability requirements.

Examination and Grant

After submission, the Patent Office examines the invention to verify its novelty and applicability. If it meets the criteria, the patent is granted, giving the owner exclusive rights.



Benefits for the Licensee :

Exclusive Access

Gain exclusive access to technology that has already been tested and validated, allowing you to build new systems with a significant competitive advantage

Savings on R&D costs

Drastically reduce development times and costs by accessing technology that is ready for commercialization.

Increase in Revenues

Our technology has the potential to expand market share on the topic of waste treatment through a green process.

Full Support

We offer technical support and consultancy throughout the implementation process, ensuring a smooth transition.



Licensing strategies

Exclusive

Grant a single exclusive license to a selected partner, ensuring a high level of control and visibility in the market.

Not Exclusive

Offer non-exclusive licenses to multiple parties, allowing greater diffusion of the invention and greater generation of revenues.

Sublicense

Allow a license holder to grant sublicenses to third parties, further broadening the scope and use of the invention.



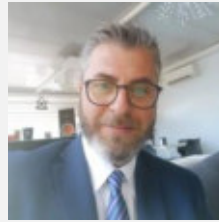
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ABSTRACT

Our patent includes an exclusive technology relating to the creation of heat exchangers for fluids at high pressures and temperatures and made up of aggressive chemical species, reducing the production cost and preventing breakages due to thermal expansion.

This technology is the result of years of research in the field of heat exchange for high temperature and pressure fluids.



VALIDATION OF EUROPEAN APPLICATION

ITALIAN PRIORITY

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PCT EXTENSION

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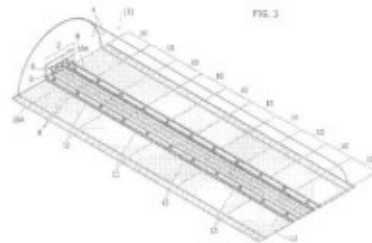
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(54) Title: HEAT EXCHANGER



(97) **Abstract:** Described herein is a heat exchanger (1). It includes: a bundle of tubes (8), each extending in a respective elongation direction (XI) and defining a flow path for a working fluid that extends in said elongation direction, wherein each tube (8) of the bundle of tubes can be supplied with a working fluid; a matrix (9) of thermally conductive material that houses the tubes (8) of said bundle and that is configured, in use, for promoting heat exchange between working fluids that run through corresponding tubes (8) of said bundle; and a shell (4) made of thermally insulating material arranged around said matrix (9), wherein: said matrix (9) is made up of a plurality of sections (10, 10') arranged aligned in said elongation direction (XI) and alternated by thermal insulations (12) that extend transversely to said elongation direction (XI).

DESCRIPTION OF THE PATENT

The purpose of the present invention is achieved by a heat exchanger having the characteristics forming the subject of the following claims, which form an integral part of the technical teaching administered here in relation to the invention.

The purpose of the present invention is achieved by a Heat Exchanger (1) including:

- ❖ a bundle of tubes, each extending in a respective direction of elongation and defining a flow path for a working fluid developing along said direction of elongation, to which each tube of the bundle is feedable by a working fluid;
- ❖ a matrix of thermally conductive material which houses the tubes of said bundle and which is configured, in use, to promote a heat exchange between working fluids which pass through corresponding tubes of said bundle,
- ❖ a shell of thermally insulating material arranged around said matrix, in which: said matrix is made in a plurality of sections interspersed with thermal interruptions developing transversely with respect to said elongation direction.



DESCRIPTION OF THE FIGURES

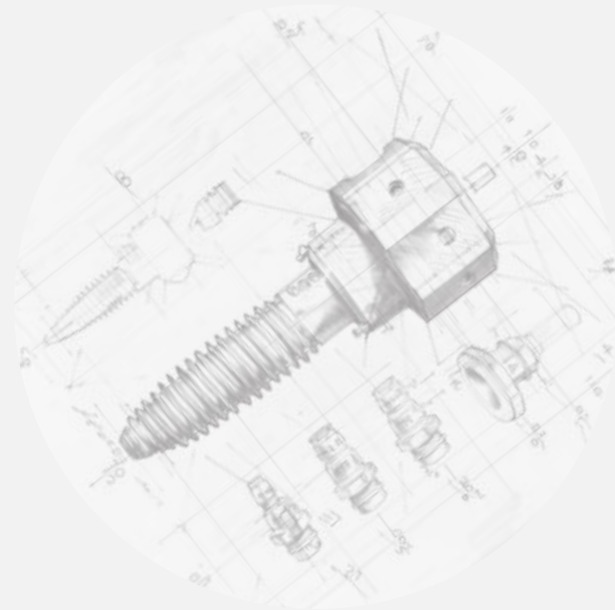
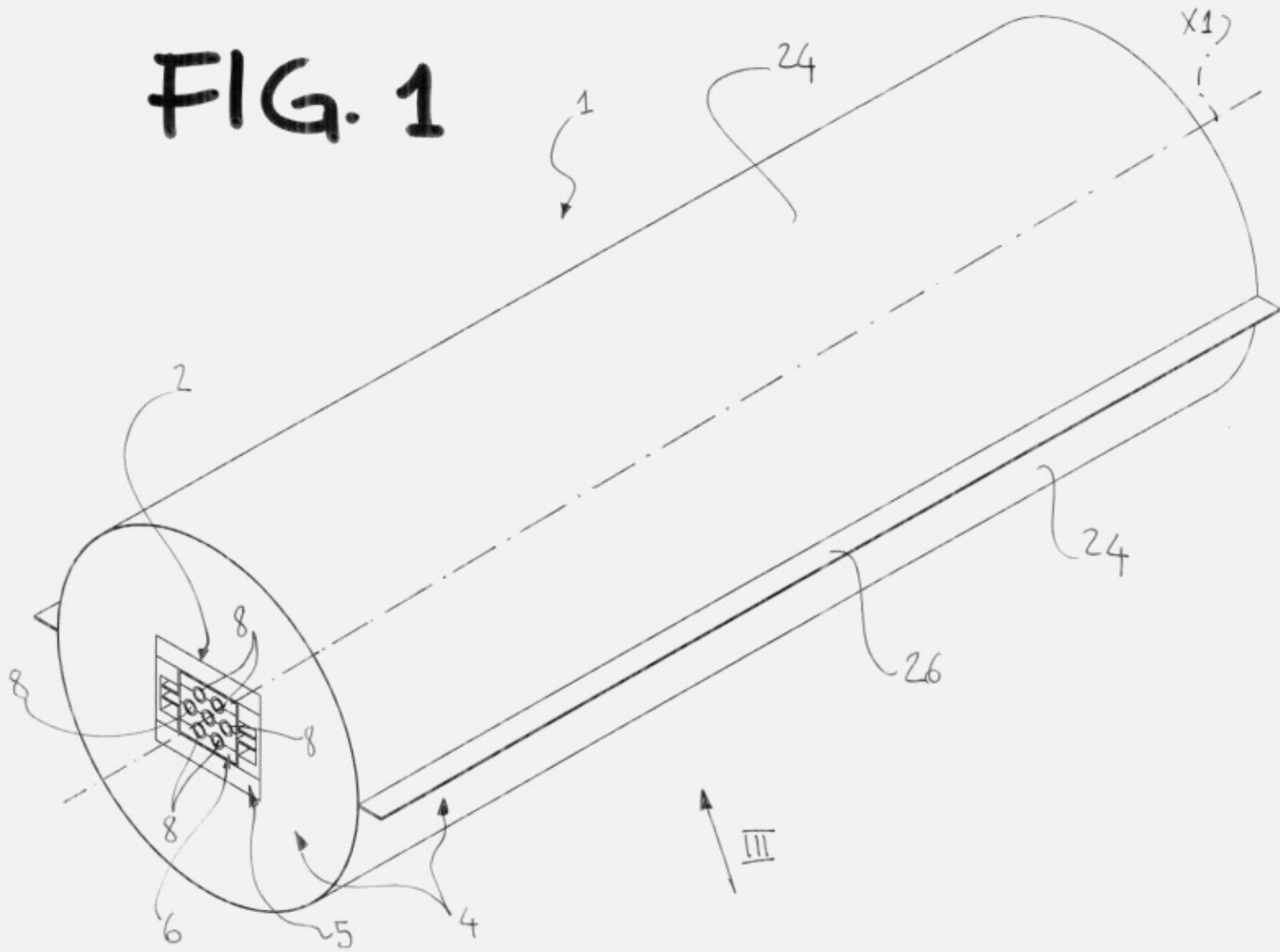
The invention will now be described with reference to the attached figures, given purely by way of non-limiting example, in which :

- ❖ Figure 1 is a perspective view of a heat exchanger according to a preferred embodiment of the invention,
- ❖ figure 2 is a front view according to arrow II of figure 1,
- ❖ figure 2A illustrates possible arrangements of tubes inside the exchanger,
- ❖ figure 3 is a perspective view according to arrow III of figure 1 and illustrating the exchanger sectioned along a longitudinal plane,
- ❖ Figure 4A and Figure 4B illustrate first and second components used in the exchanger matrix according to the invention,
- ❖ figure 4C illustrates an exploded view of a portion of the matrix of the exchanger according to the invention, while figure 4D illustrates an assembled view of the components of figure 4C,
- ❖ figures 5, 6A, 6B illustrate further components of the exchanger based on the invention, and
- ❖ figure 7 graphically illustrates a technical advantage of the present invention.



PATENT DESIGNS

FIG. 1



PATENT DESIGNS

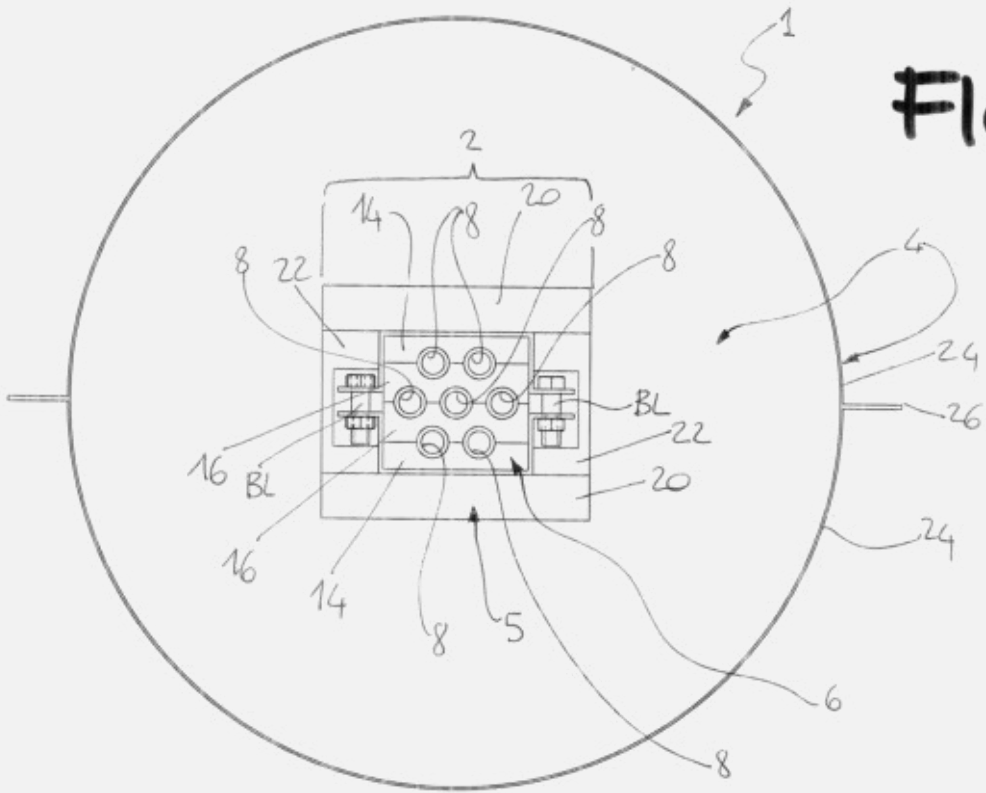
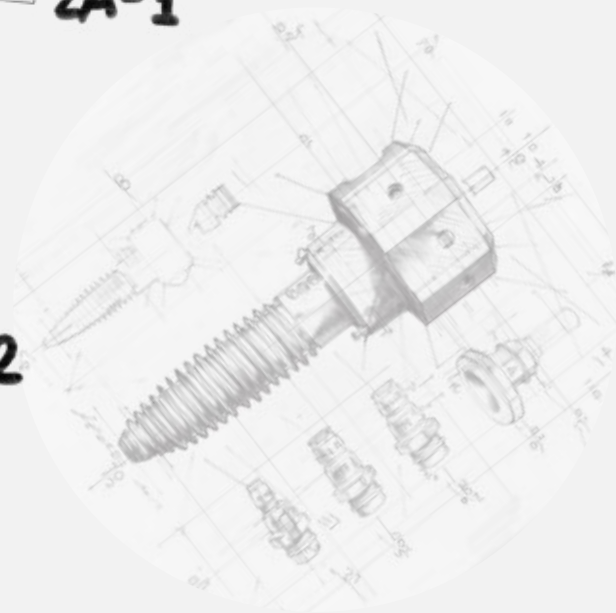
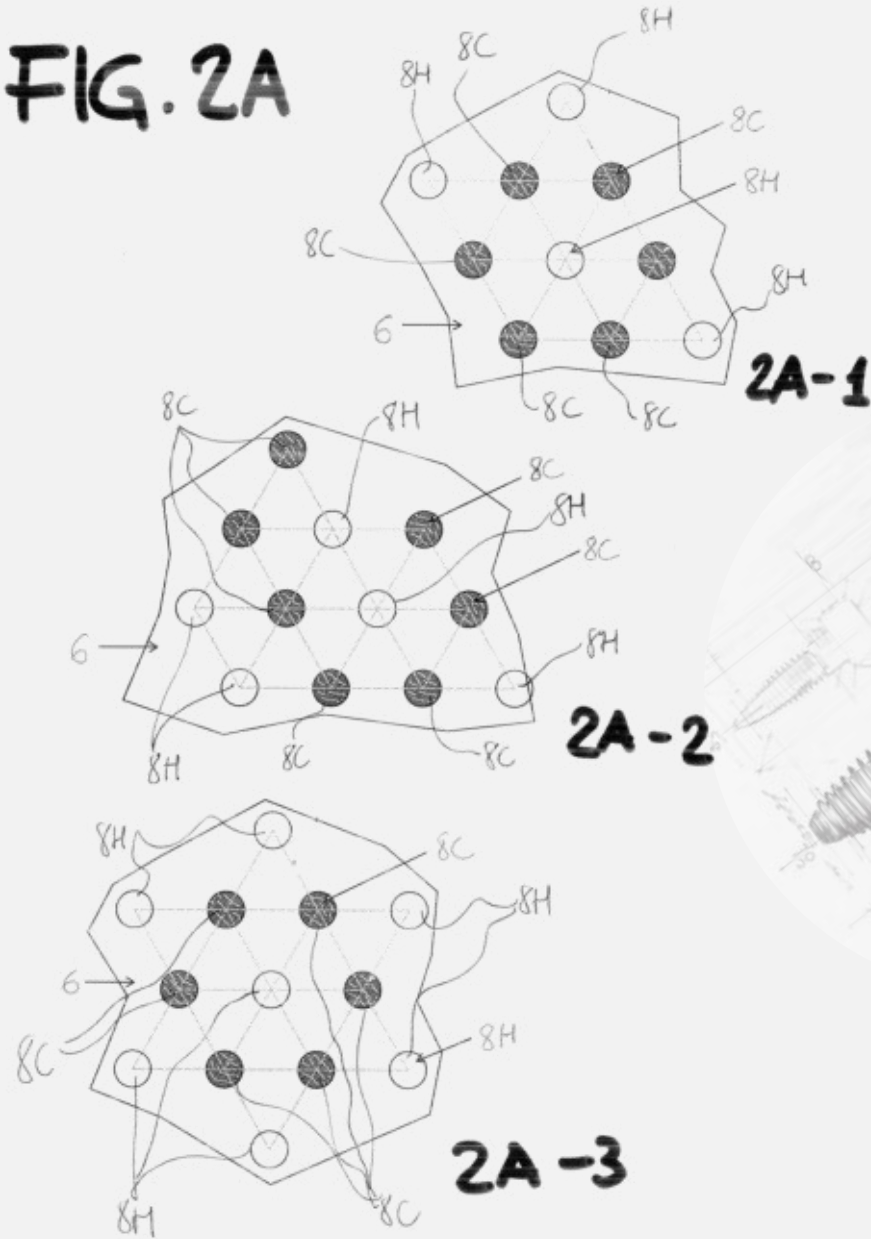
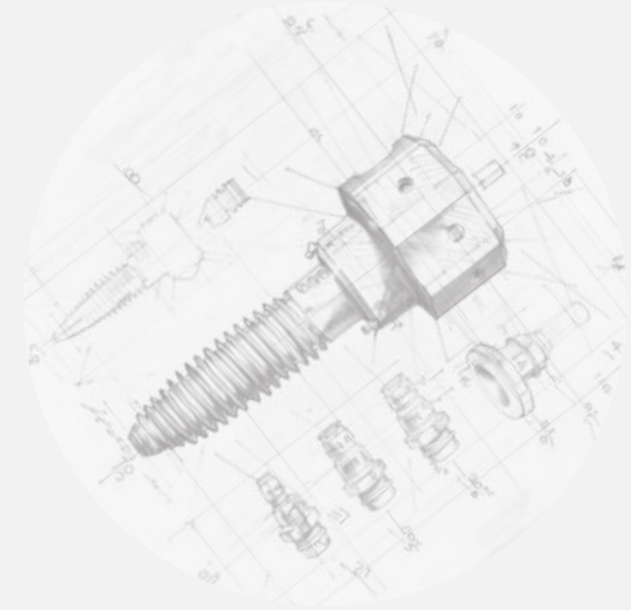
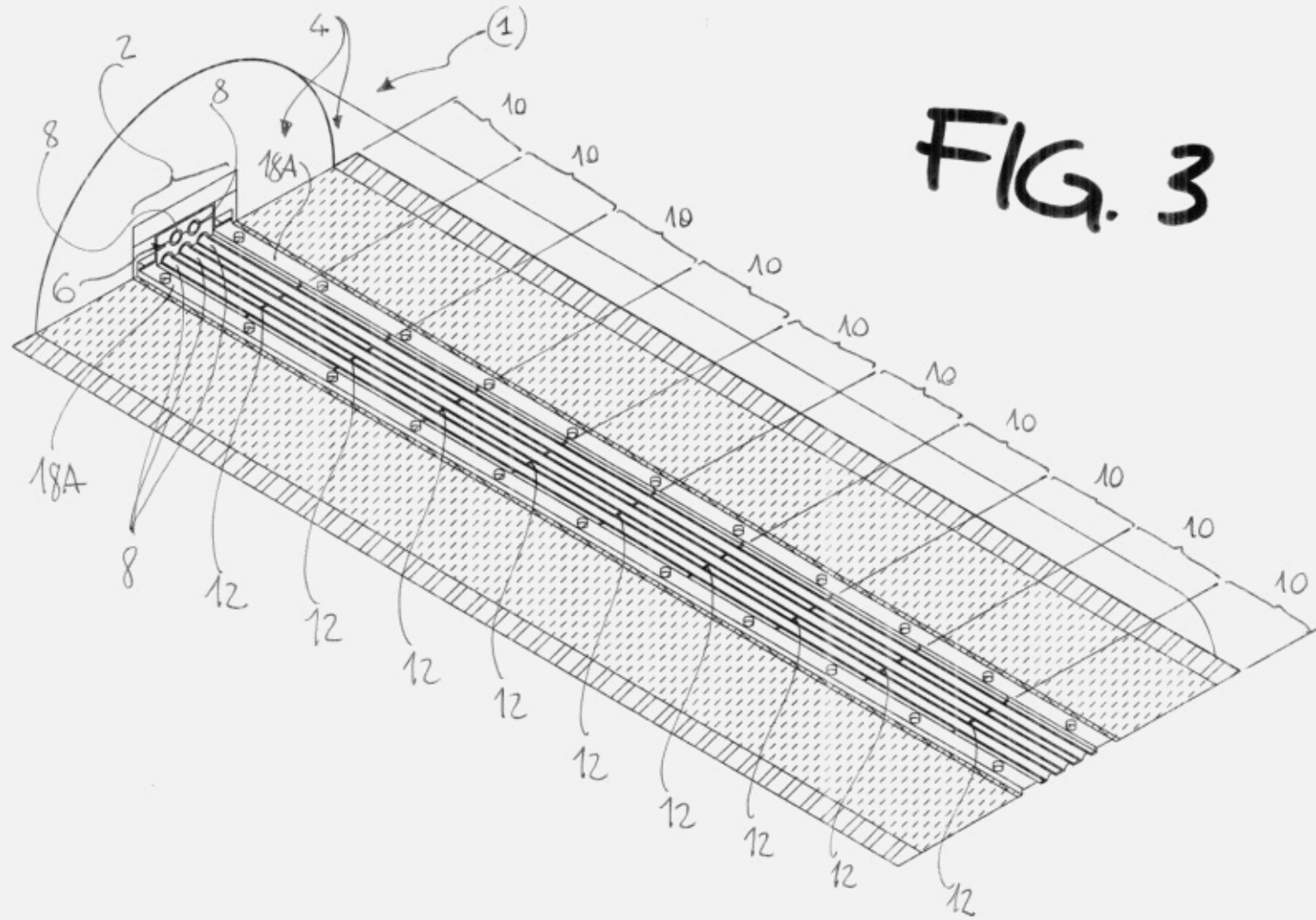


FIG. 2A



PATENT DESIGNS



PATENT DESIGNS

FIG. 4A

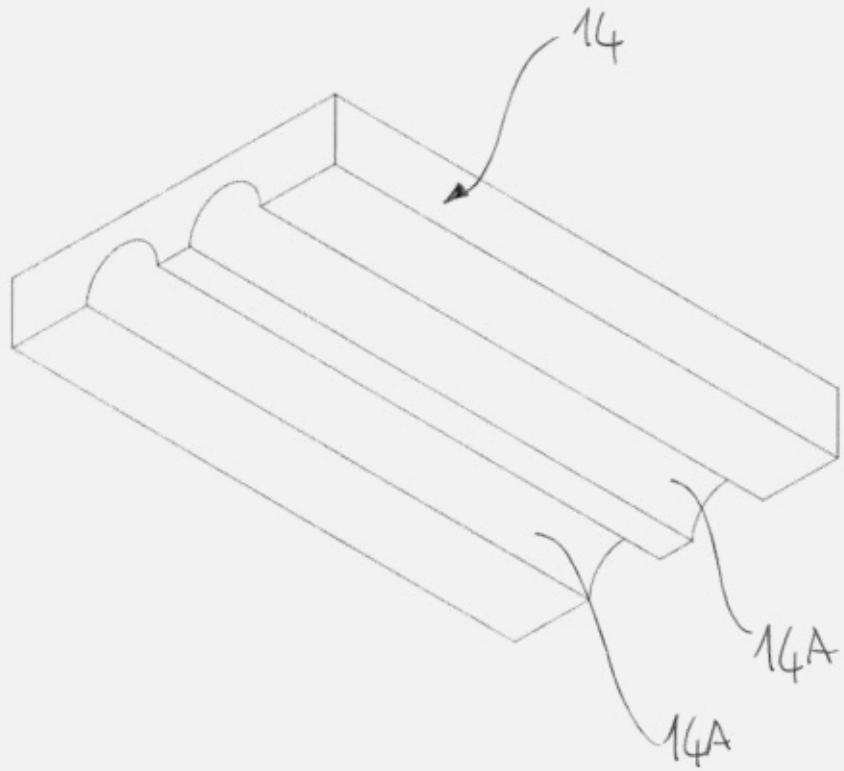
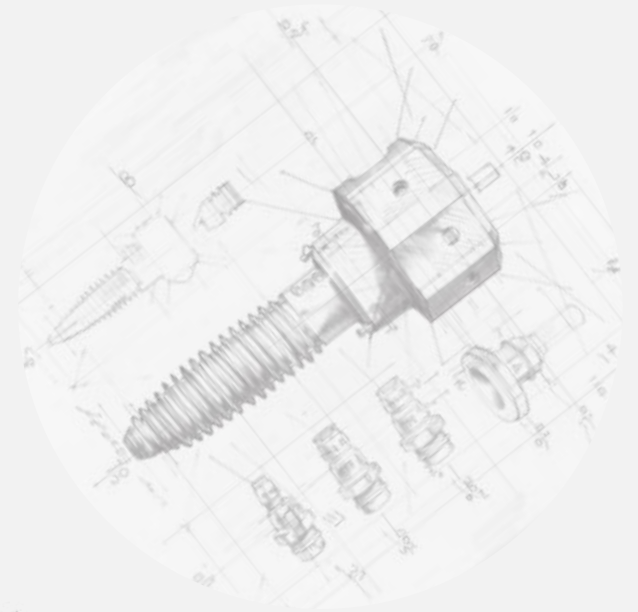
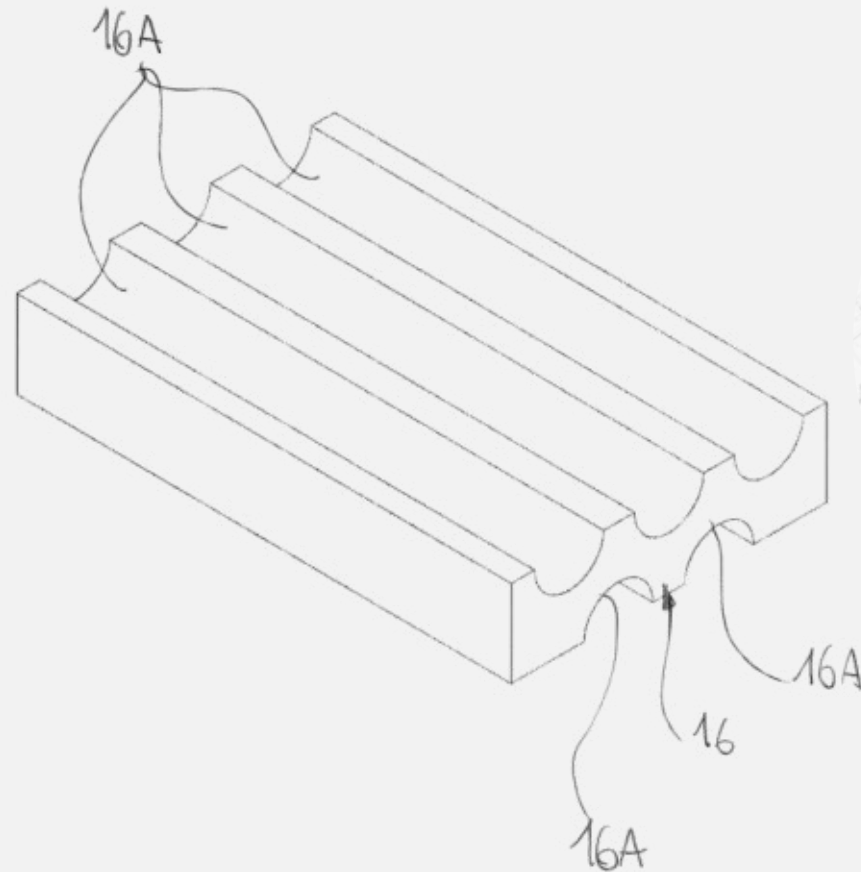
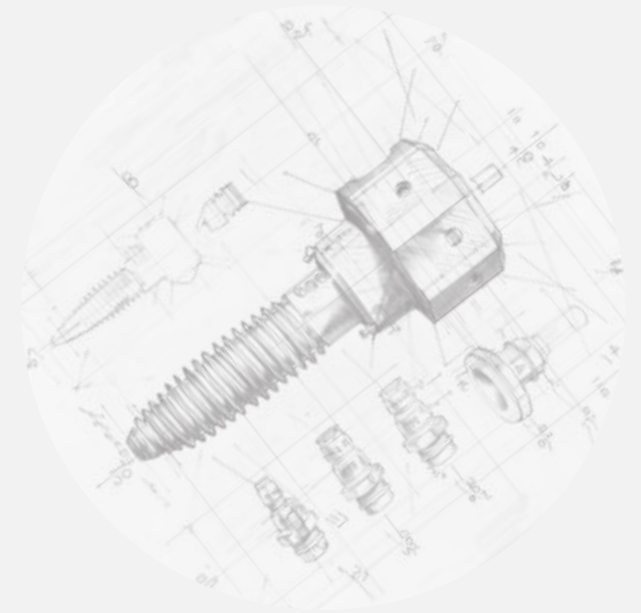
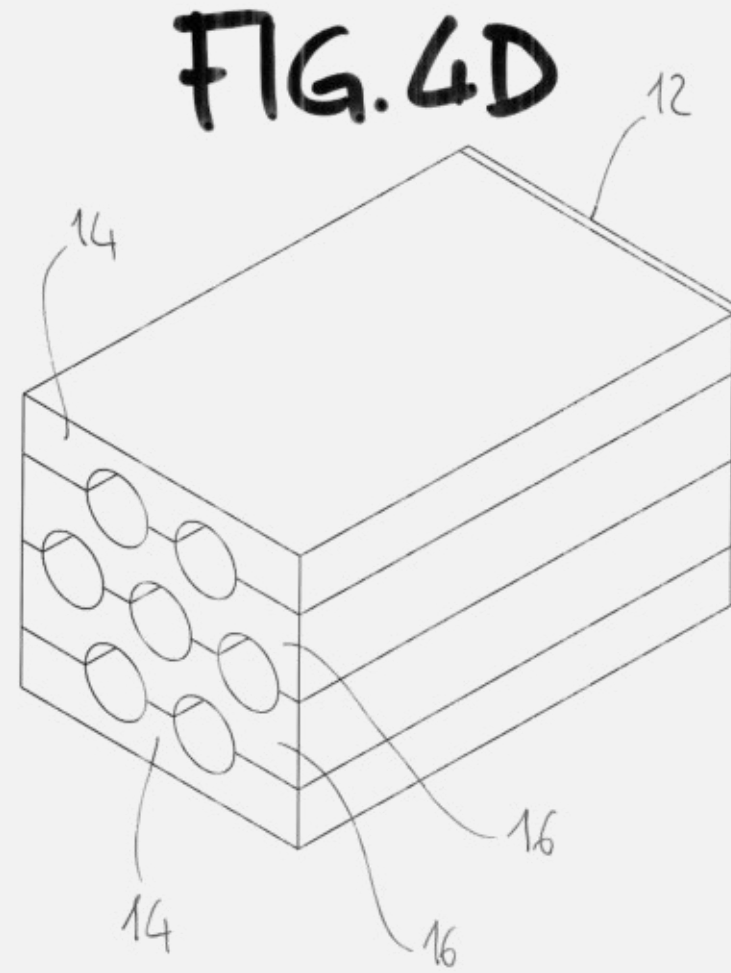
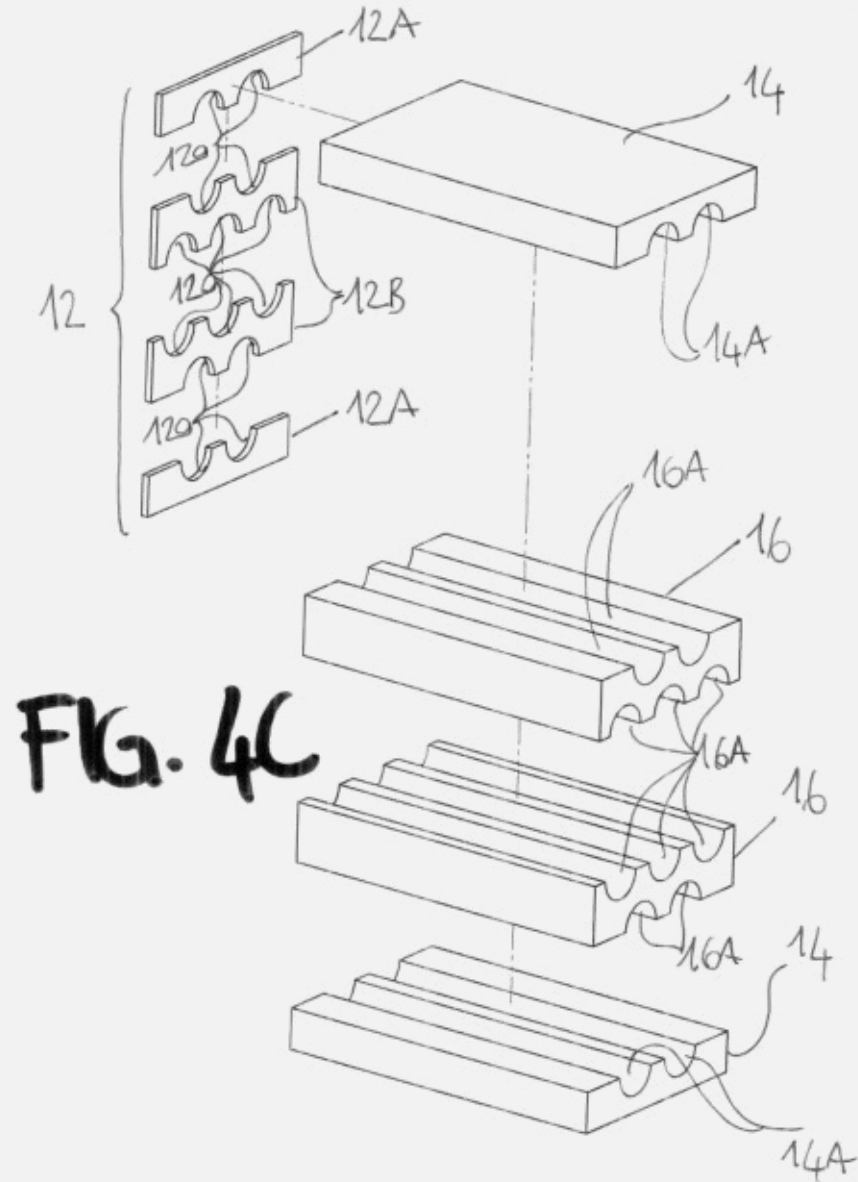


FIG. 4B



PATENT DESIGNS



PATENT DESIGNS

FIG. 5

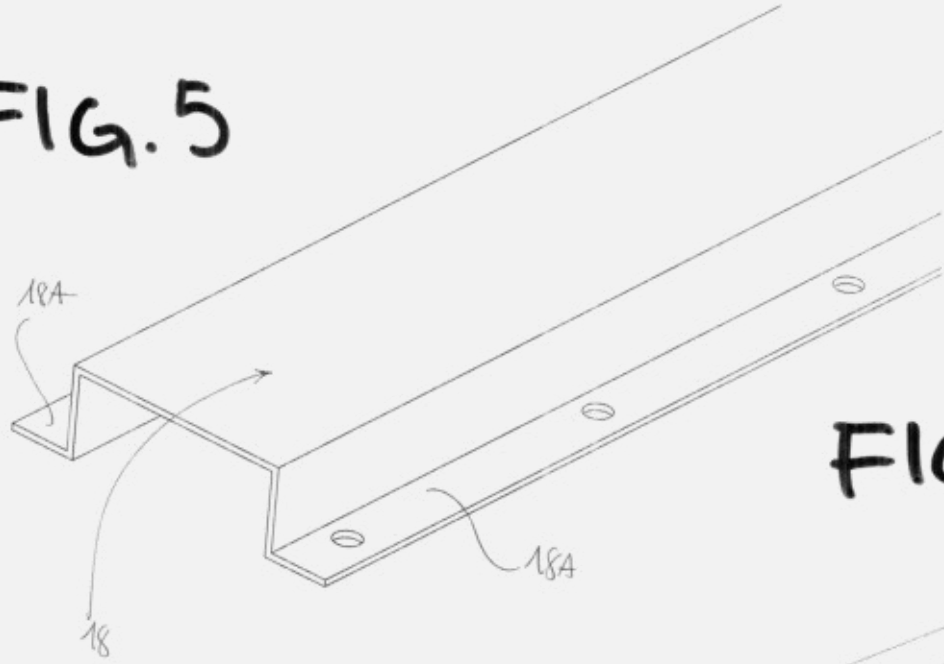


FIG. 6A

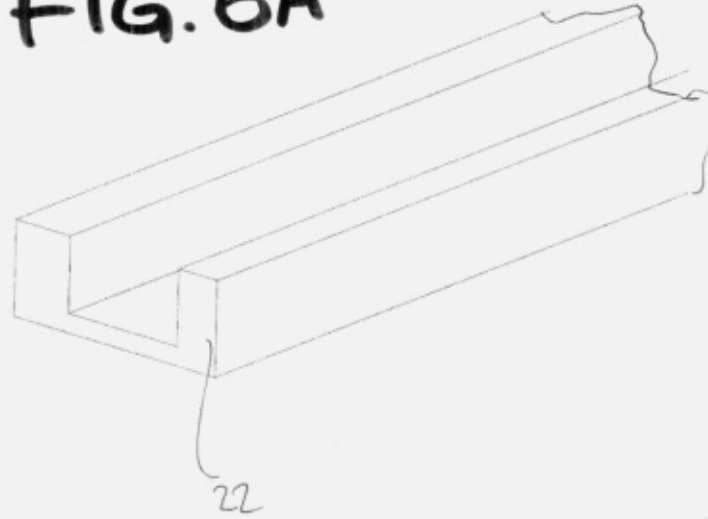
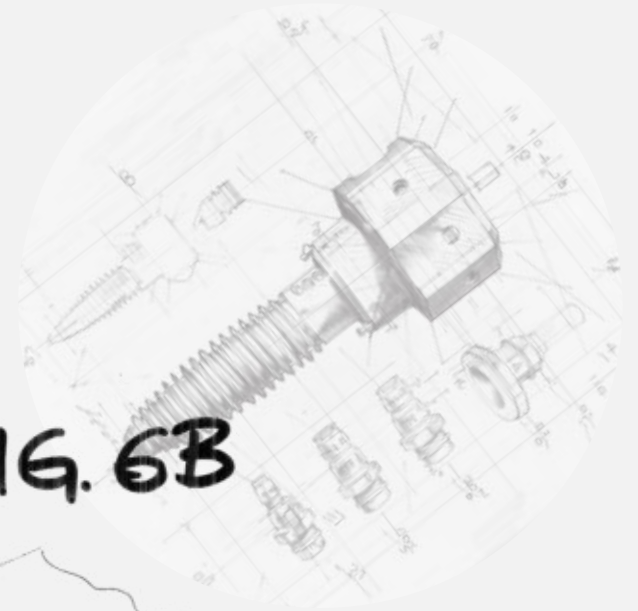
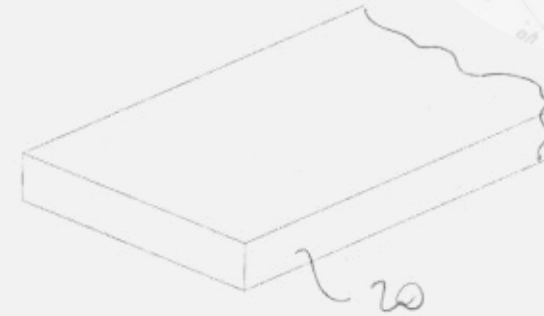
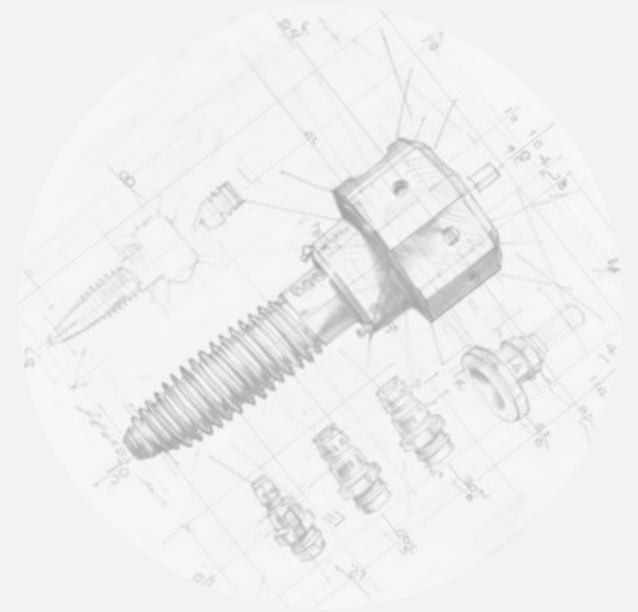
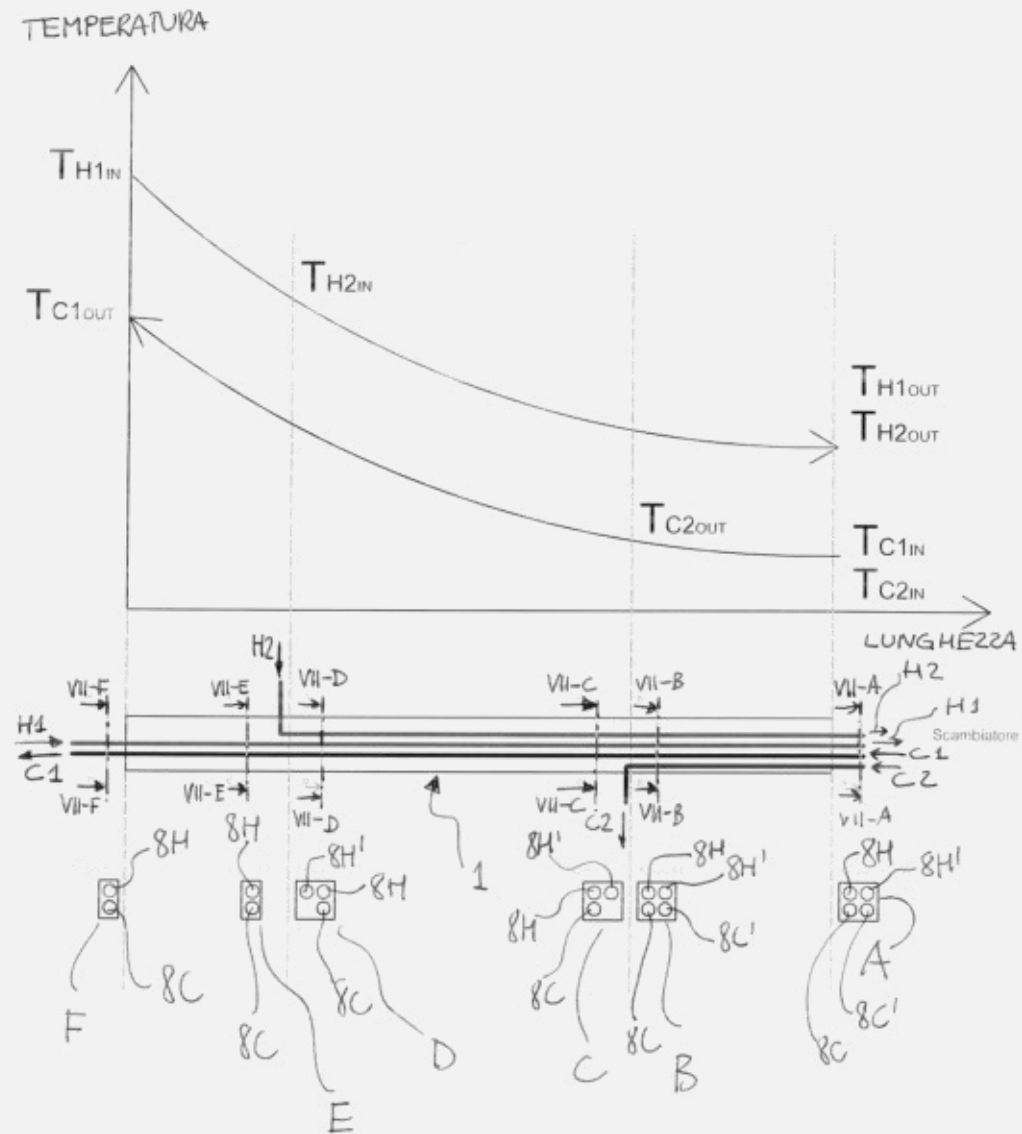


FIG. 6B



PATENT DESIGNS

FIG. 7



Known technique and general technical problem

Fluids at high pressure and temperature, possibly carrying aggressive chemical species, require exchangers of highly specialized construction, generally based on the so-called double tube technology.

This technology involves the creation of exchangers with a pair of tubular elements, one inside the other, within which a hot fluid and a cold fluid flow. However, this technology is likely to require huge economic resources for the production and installation of the exchanger and also involves the adoption of very complex technological solutions to compensate for the different thermal expansions in the axial direction of the internal tube compared to the external tube in operation, which fluid flows through each tube.

This forces, in the case of traditional double-tube or tube-and-shell exchangers that operate in conditions of high fluid temperature, to provide expansion joints for the connection of the internal and external tubes to the pipes that bring the fluids to the exchanger, or to prepare expensive and complex floating warheads. Please note that the exchanger must be made with materials capable of resisting very considerable structural stresses (thermal and mechanical stress) and at the same time equally significant chemical stresses (corrosion and embrittlement).



Known technique and general technical problem

For these reasons, the creation of these devices is not at all simple and even less economical, as the guarantee of structural resistance alone forces the use of very high wall thicknesses with consequent multiplication of material costs as high-strength steels must be used. However, the exchanger is intrinsically exceptionally expensive due to the need to adopt high-strength alloys such as Inconel 825 or AISI 316L steel in order to withstand exposure to the aggressive chemical species that populate the fluid flow.

The high wall thickness then requires that the exchanger tubes be obtained by machining the shavings of monolithic ingots cast in the foundry, or by grinding drawn cylindrical tubular elements.

In both cases, the materials used and the wall thicknesses involved are likely to affect the cost of the work to such an extent as to have a non-negligible impact on the general economy of a system where the exchanger is to be used, in addition to all the aforementioned construction complications.



Field of Application and uses

Field of invention

The invention was developed with particular reference to systems in which a heat exchange between two or more fluids and between different temperatures of the same fluids is necessary. High pressure and temperature and/or corrosive which would require special Inconel and/or high thickness steels with considerable production costs



Possible interested users

Factories and Builders

- ❖ Heat exchangers
- ❖ Boilers
- ❖ Process equipment

Industries:

- ❖ Production of technical gases (oxygen, nitrogen, co2, etc.)
- ❖ chemicals
- ❖ Pharmaceuticals;
- ❖ agri-food
- ❖ Paper mills;
- ❖ Refineries
- ❖ Tanneries
- ❖ Production and treatment of polymers, rubbers and plastics
- ❖ Energy production from fossil sources
- ❖ Cryogenic processes
- ❖ Technical gas production industries (N2, CO2, O2, etc.)



Conclusions

Summary of Key Points

Patenting and licensing offer unique opportunities to leverage innovation and generate revenue. Making the most of the benefits deriving from an effective licensing strategy is essential.

Maximize Profits

Optimizing the use of patents and licenses allows you to maximize profits and effectiveness on the market, guaranteeing a position of competitive advantage.

Action for Valorization

To fully capitalize on patent and licensing, it is essential to develop and implement a targeted strategy, taking advantage of the various opportunities offered by the market.

