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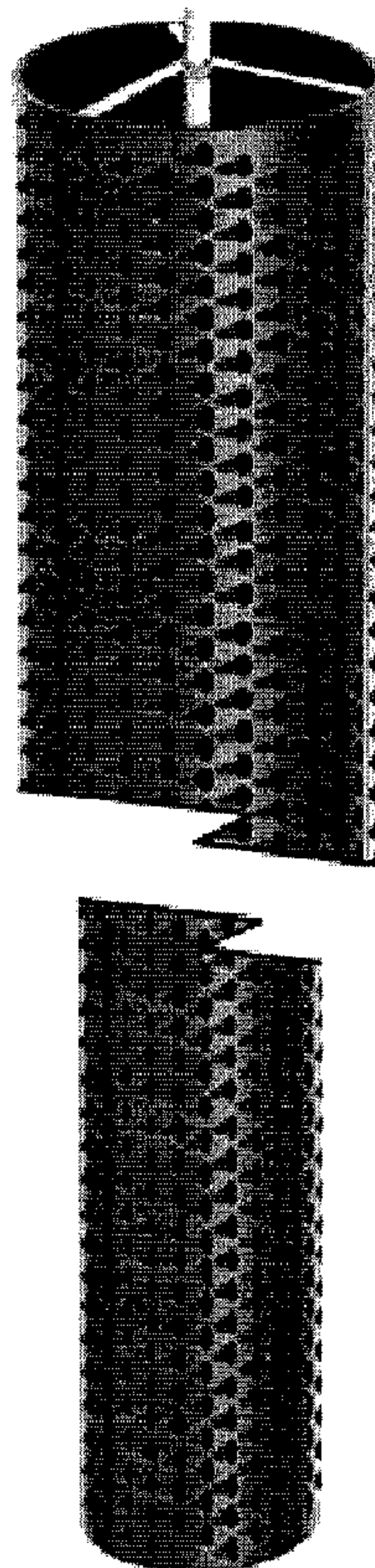
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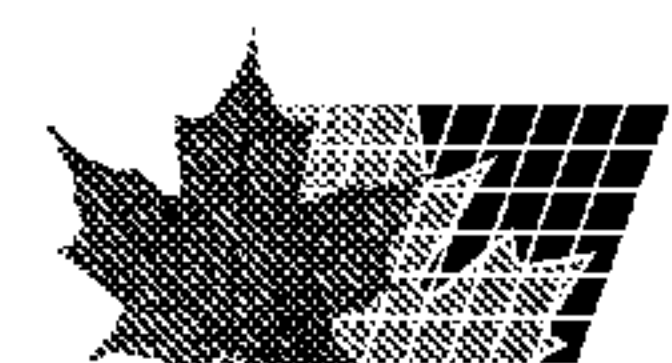
(54) Titre : DISPOSITIF D'HYDROTURBINE OCEANIQUE EN EAU PROFONDE

(54) Title: DEEP OCEAN WATER TURBINE ASSEMBLY



(57) Abrégé/Abstract:

This invention is a deep ocean water turbine assembly for generating "Green" electrical energy from the ocean conveyor currents. The turbine assembly consists of several vertically rotating cylinders with fixed blades to catch the conveyor current. The design of



(57) **Abrégé(suite)/Abstract(continued):**

the cylinder blades is such that the current flow would be caught only on one side of the cylinder and would flow unimpeded past the opposite side thus causing the cylinder to rotate. Thus no hydrocarbon or external energy source is required to produce 100% "Green" electrical energy.

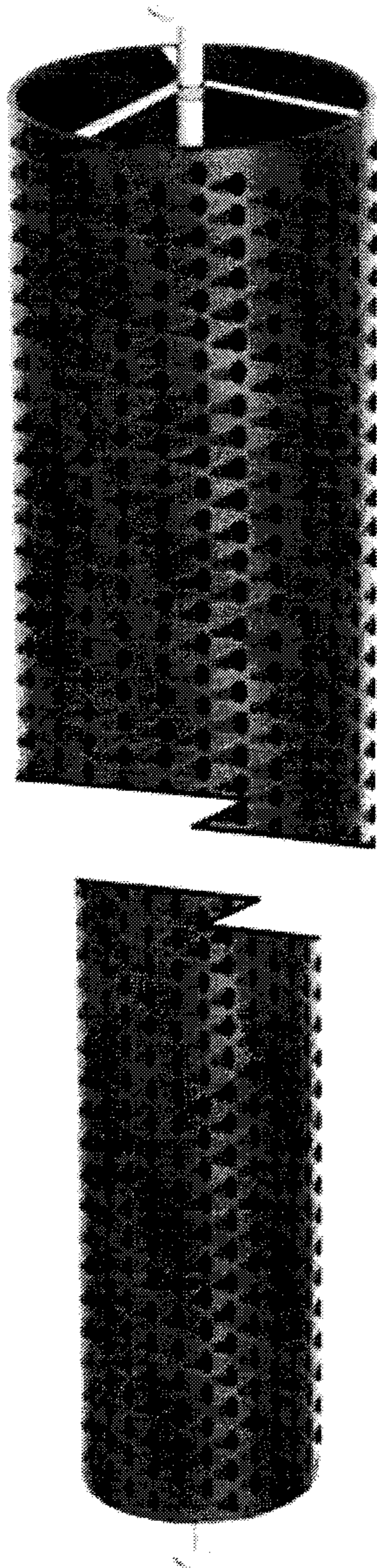
Petition for a Patent

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Agent:	To be named
Patent name:	Deep ocean water turbine assembly

Abstract: Green Technology

This invention is a deep ocean water turbine assembly for generating "Green" electrical energy from the ocean conveyor currents. The turbine assembly consists of several vertically rotating cylinders with fixed blades to catch the conveyor current.

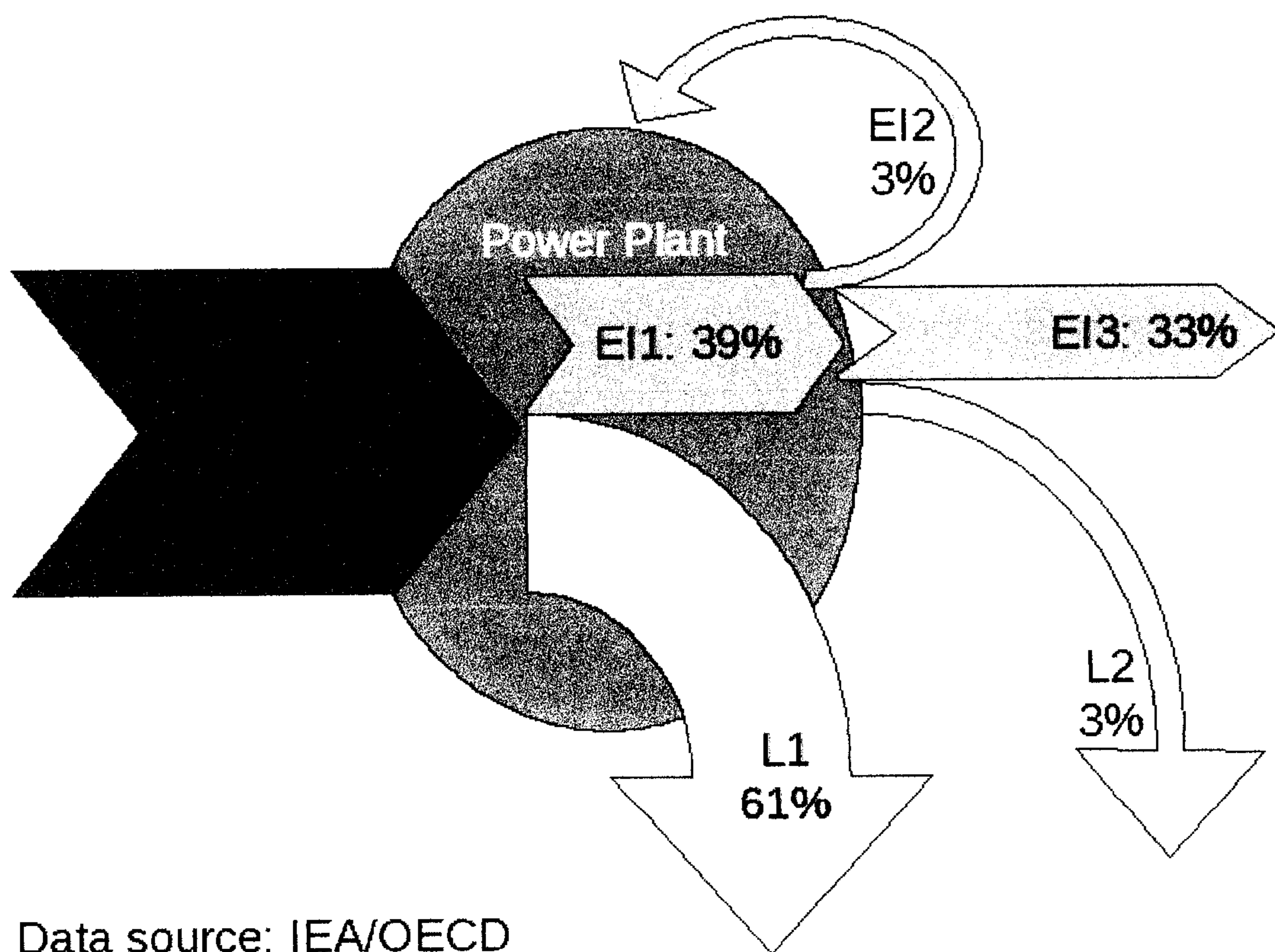
The design of the cylinder blades is such that the current flow would be caught only on one side of the cylinder and would flow unimpeded past the opposite side thus causing the cylinder to rotate. Thus no hydrocarbon or external energy source is required to produce 100% "Green" electrical energy.



Technical Field: The **Deep Ocean Water Turbine Assembly** would be applied to the technical field of Global Electricity Generation by harnessing the water flows of the deep ocean currents.

In the International Energy Outlook 2016 Reference case (IEO2016), world net electricity generation is projected to increase 69% by 2040, from 21.6 trillion kilowatthours (kWh) in 2012 to 25.8 trillion kWh in 2020 and 36.5 trillion kWh in 2040. Electricity is the world's fastest-growing form of end-use energy consumption, as it has been for many decades. Since the late 1980s, coal has consistently met 37% to 40% of world fuel requirements for electricity generation.

At the turn of the second millennium the global efficiency of converting primal energy into a useable form such as heat for thermoelectric power was about 70% and then converting that electricity to work was about 40% resulting in an over all efficiency of around 28%. Most energy analysis reports energy efficiency of 15 to 30%.

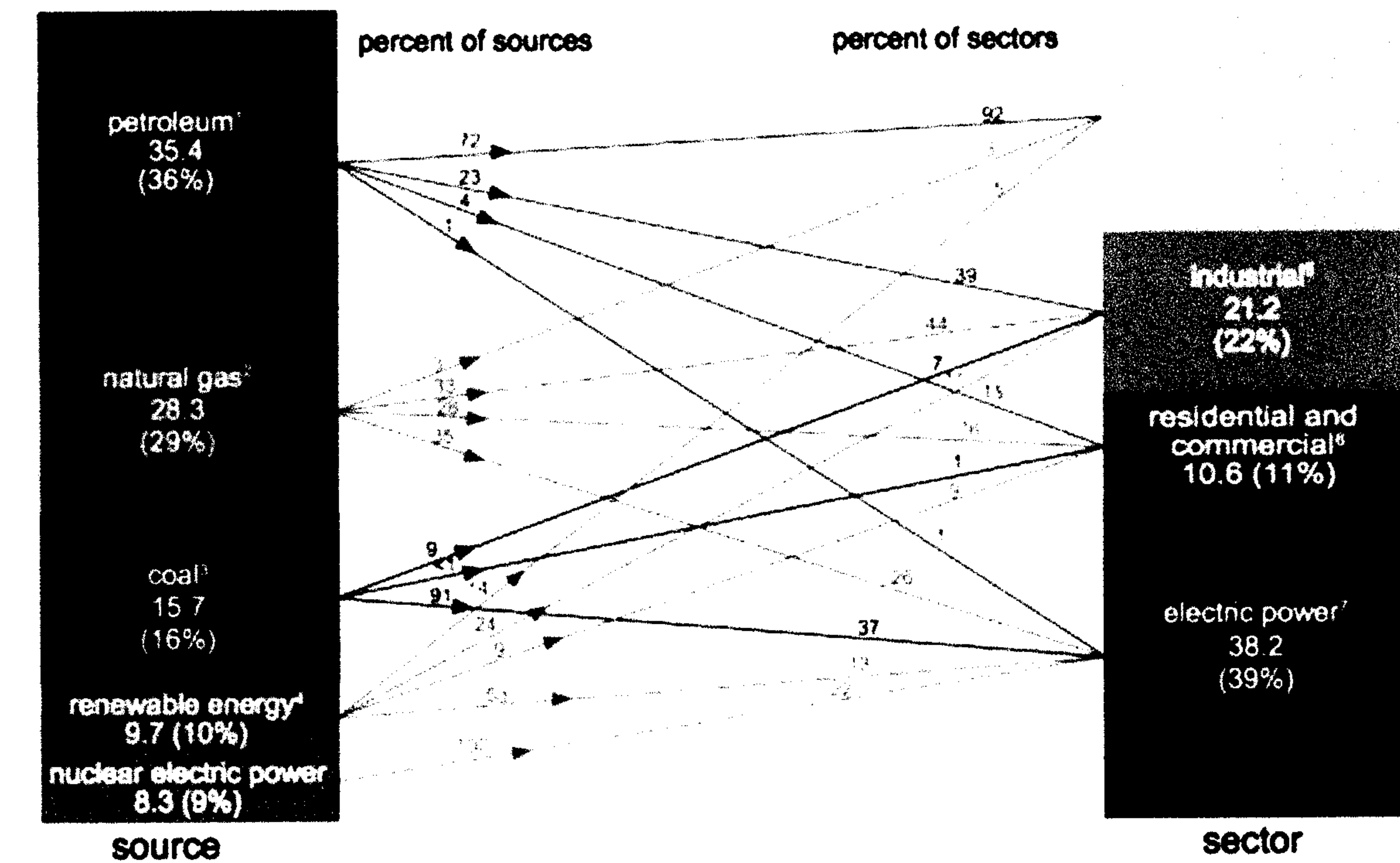


Data source: IEA/OECD

Energy flow of Power Plant, E1=Energy consumed, E11=Electricity generated, E12=Internal use, E13=Electricity for consumption, L1=Processing Loss, L2=Transmission Loss. (Result of year 2008)

U.S. primary energy consumption by source and sector, 2015

Total = 97.7 quadrillion British thermal units (Btu)



**Source: U.S. Energy Information Administration,
Monthly Energy Review (Apr 2016) Tables 1.3, 2.1-2.6.**

However, for power generation, British Petroleum estimates that our efficiency of hydrocarbon conversion to electricity is only at best 39% and uses a figure of approx 16 GJ per Toe.

This calculates out that $20,122 \text{ TWh} / 11.63 = 1,730.2 \text{ Mtoe}$ at 39% efficiency means that 4,436.4 Mtoe (approx 40% of our hydrocarbons) are needed to generate 70.6% of the electricity that we consume. Of which approx 70% is lost in generation and transmission leaving us with a 15 to 30% maximum efficiency to do the actual work. Currently there are over 50,000 coal fired power generation plants world wide. Thus, our single biggest goal is improved efficiency of power generation and the eventual machine work produced, especially in countries with outdated and vastly inferior technologies.

The advantages of the Deep Ocean Water Turbine Assembly:

1. No land area required or ocean surface obstructions.
2. No hydrocarbons or nuclear fuel required.
3. As the assembly is suspended in the deep ocean currents there is no sediment buildup.
4. Made of a plastic composition that is impervious to marine life providing an exception long life. Because of the protective grill, the assembly is also harmless to all marine life.
5. Power supply can service all countries, except the most land locked.
6. Provides continuous operation as there are no wind or sunshine restrictions.
7. The assembly is component designed and built for ease of serviceability.
8. With the exception of the generators (which can be easily replaced) and the bearings that hold it in place, there is only one moving part, the rotating cylinder.
9. The assembly operates at 35% capacity allowing easy adjustment to peak demands.

Side benefits of the Deep Ocean Water Turbine Assembly:

1. The cylinders can access the deep ocean thermocline nutrients and vent these upward to feed algae and fish stocks.
2. The cylinders can access the deep ocean water of the thermocline and vent these cold waters upward to cool surface ocean temperatures.
3. The transmission cables can be made heavier and better insulated (because they lie on the ocean floor) providing a more efficient transmission of electrical power. It is estimated that transmission efficiency would increase by approximately 40%. Siemens states that HVDC transmission losses are about 3.5% per 1,000 km, which are 30 — 40% less than with AC lines, at the same voltage levels. This is because direct current transfers only active power and thus causes lower losses than alternating current, which transfers both active and reactive power.

Background of the invention and the global need: From the realization of the demand for a global 'clean' electricity source and the imitations of all other similar inventions the **Deep Ocean Water Turbine Assembly** was created. Whether or not the burning of hydrocarbons is an influence on the issue of Global Warming, if a system could be implemented that would eliminate our need to burn hydrocarbons to generate electricity, we could reduce our global greenhouse gas emissions by 20-30% in just a few years.

The other factor was the limitations of other new water turbine electrical energy generation systems. These systems all relied upon some sort of mechanical method of hinged, folding, blades or propellers that were immersed or floated in a water stream. In many cases these systems allowed the water stream to flow back on itself creating drags and counter currents. Most of these systems were all very limited in their serviceability and are required to be sparsely grouped dramatically limiting their abilities to generate or transmit an effective electrical load.

Summary of the invention: The **Deep Ocean Water Turbine Assembly** in its simplest form is a rotating cylinder with a generator at the top and bottom. The cylinder has a number of concave blades/pockets on the outside surface to catch the water flow causing it to rotate thus turning the central rotor of each generator. For ease of illustration, what is not shown in the drawings are the generators, structural supports, protective screens, flow regulators, underwater transmission cables or any of the anchor cables.

Revised claims:

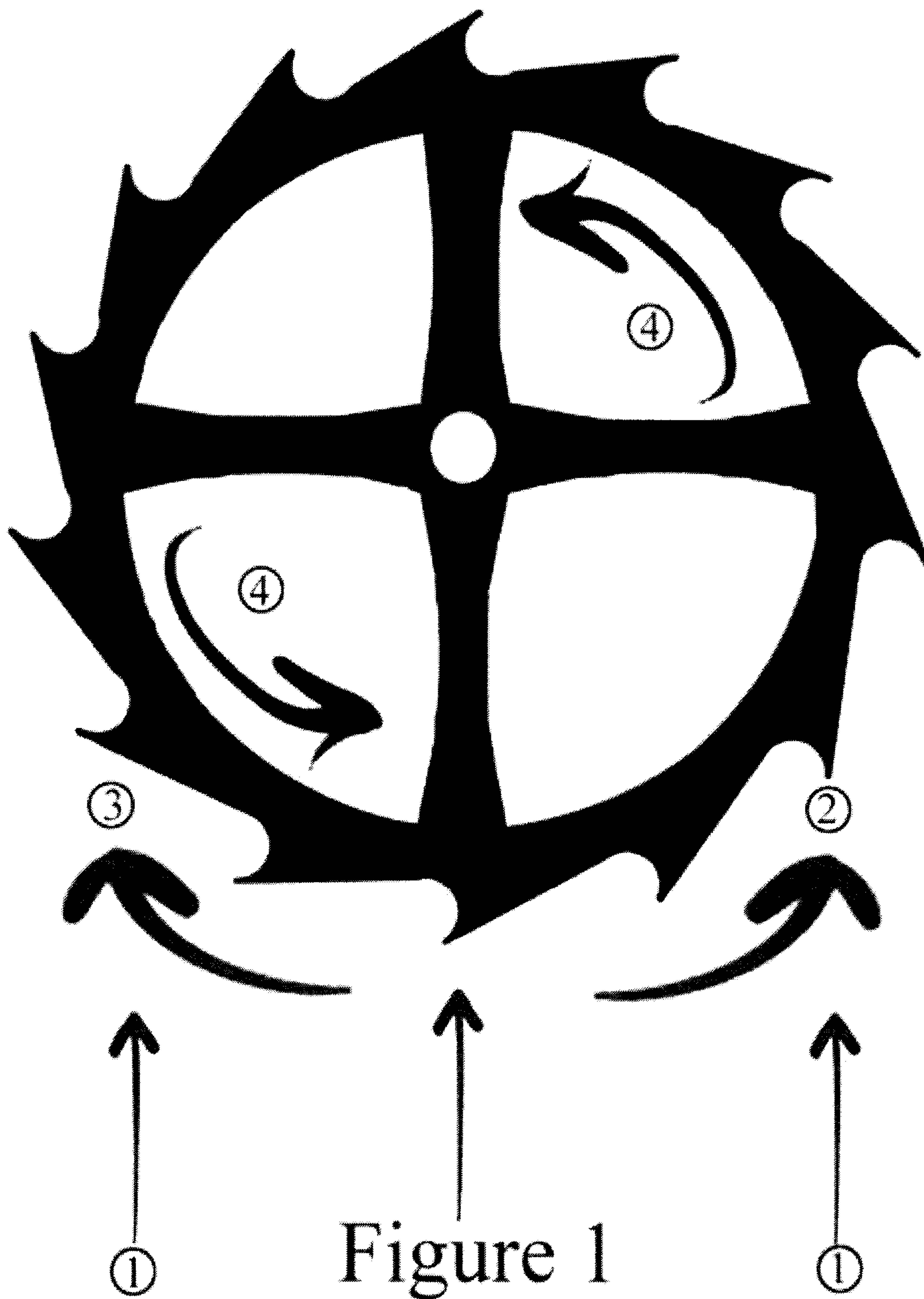
The principle component of the **Deep Ocean Water Turbine Assembly** is the rotating cylinder. With the exception of the bearings that hold each cylinder in place it is all one piece. There are no hinged, folding, blades, propellers, vents or holes that would cause any turbulent or counter flows of water. This cylinder is a composite of recycled plastics, carbon fibre and nitrogen gas that is impervious to all marine organisms and along with the support structures has a positive buoyancy sufficient to support the weight of the generators and metal components.

As such in the category of the invention of Global Electricity Generation the **Deep Ocean Water Turbine Assembly** is unique. These cylinders can be grouped together to generate an enormous electrical supply. They can be easily serviced as each cylinder is impervious to all marine life and also because each assembly is positioned 60 metres below the surface of the ocean and down to 300 metres, there are no sediment buildups or obstructions to any marine traffic. Each assembly has a protective screen/grill to deflect away any marine life. As the ocean currents are approximately 2.7m/s, this flow is controlled by louvers on the front faces of the assembly.

The **Deep Ocean Water Turbine Assembly** meets the needs of a growing Global energy demand that is 100% free of any hydrocarbon or nuclear restrictions.

Additional claims describes further features of this invention:

1. Because of this unique design, no ducting or channelling of the current flow is required.
2. Because of this unique design, current flow from any direction will cause the cylinder to always rotate in the same direction.
3. Because of this unique design, current flow can come at the cylinder from many different directions of different levels at the same time and the cylinder will still rotate in the same direction.
4. Because of this unique design, several cylinders can be grouped together in alternating blade positions to counter any torque disturbance. Specifically the first cylinder is placed upright and the next cylinder is place upside down. The blades on the first cylinder catch the current flow on the right side causing a counterclockwise rotation while the blades on the second cylinder catch the current flow on the left side causing a clockwise rotation.
5. Because of this unique design and proprietary software, the electrical energy produced is 100% "Green" electricity.



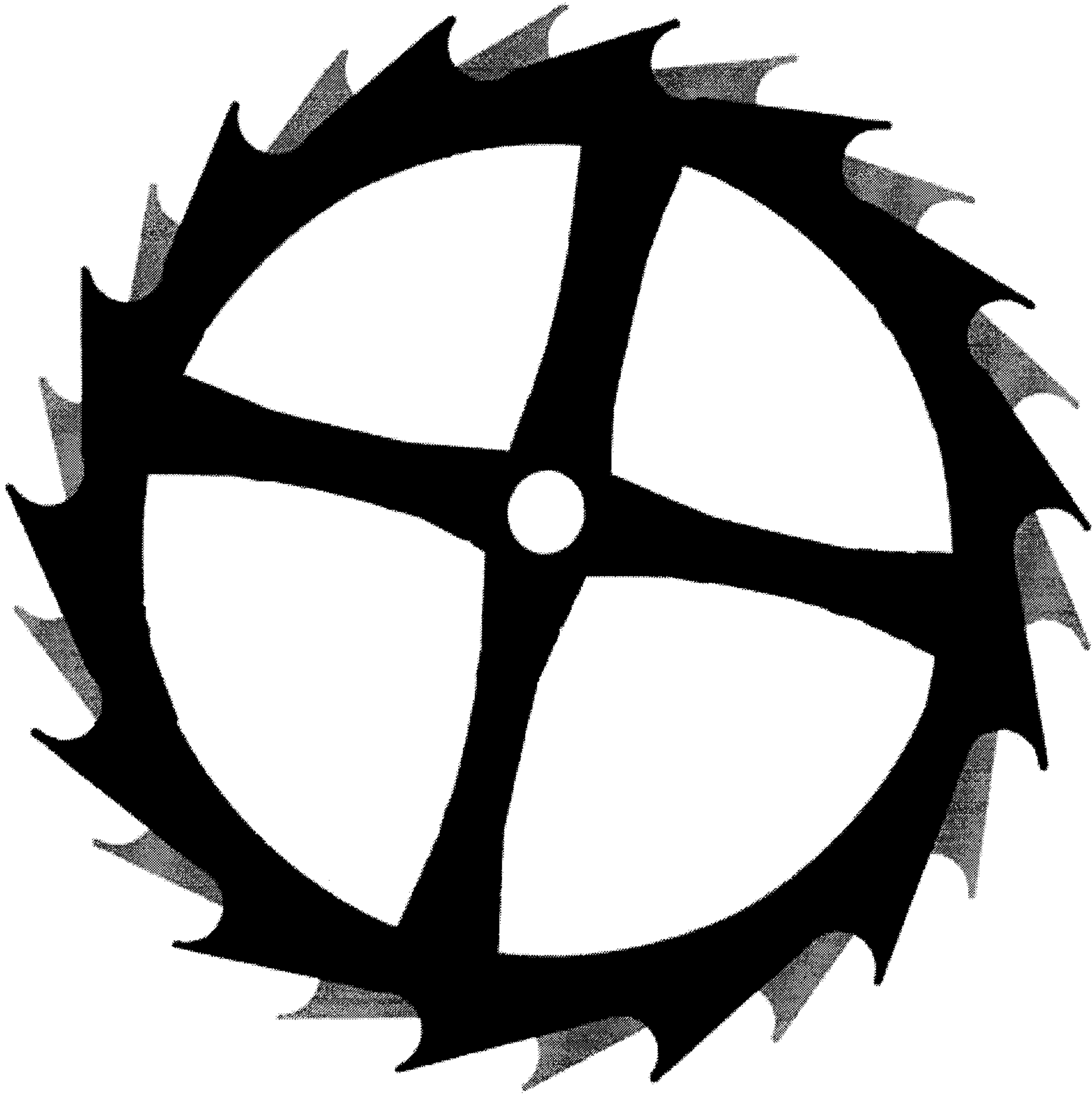


Figure 2

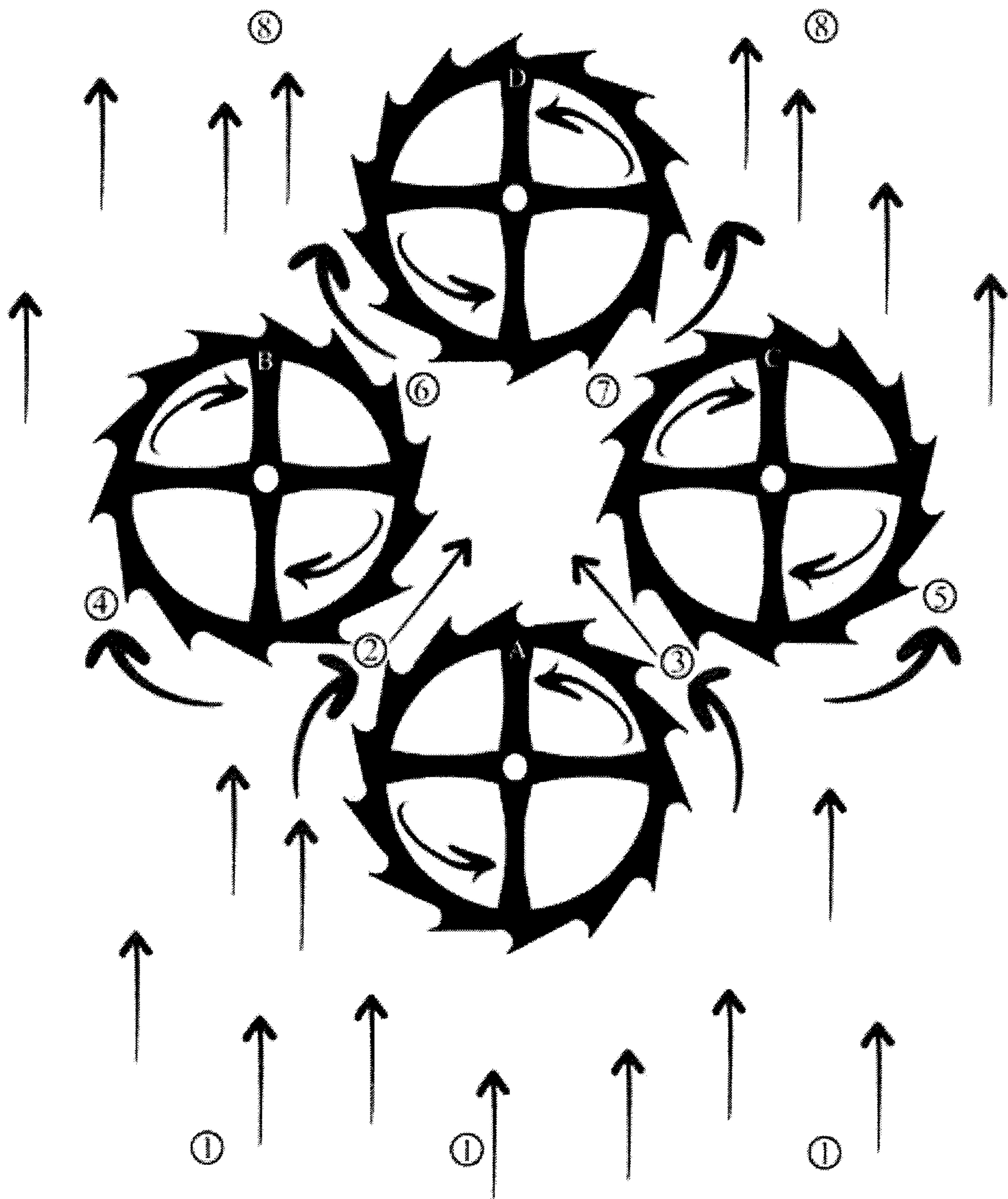


Figure 3

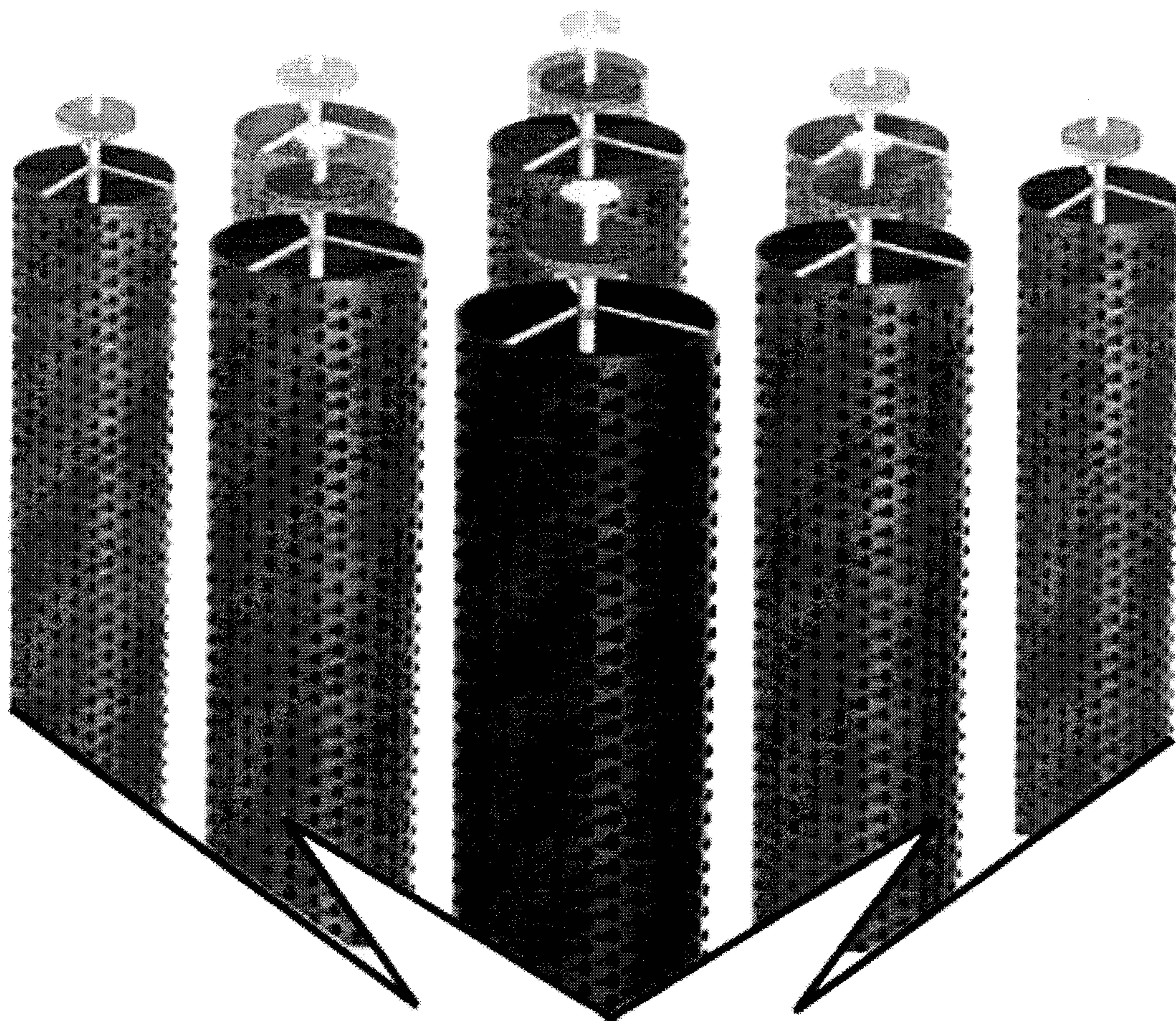


Figure 4



Figure 5

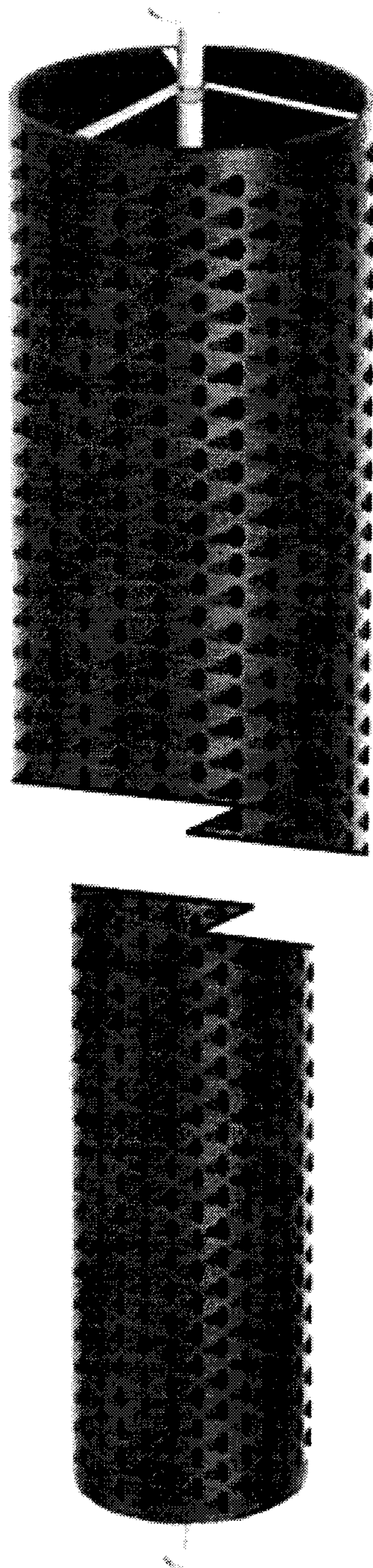


Figure 6

