



**KEELCRAB™**

***Underwater robot  
for Boat hull maintenance:  
clean & inspection***



**A3** ELFE S.R.L.

## PROBLEM: BOAT HULL FOULING = MARKET NEEDS



### Problem:

- Vegetation
- Barnacles
- Contaminants
- Hull fouling

### Effect

- Fuel consumption
- Performance/Speed
- More pollution
- More Antifouling
- Damage to Hull
- Ugly waterline

## REMEDIES THAT TYPICALLY CAN FIND ON THE MARKET

### CRANE



- Expensive
- Time
- Boat Moving



### DIVERS



- Dangerous
- Expensive
- Often prohibited / polluting



## SOME IMPORTANT AID OR PALLIATIVES TYPICALLY USED

### OLD POLLUTING ANTI FOULING COATINGS

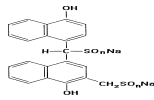
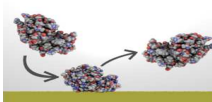


- Pollutant
- Last century..



### NEW NON-POLLUTING COATINGS & ULTRA SOUND ANTI FOULING

COATINGS



- New, non-polluting but expensive
- Not yet used in many markets but it will be the future of coating



ULTRA SOUND



- Still skepticism in some markets
- Very functional against the animal but less against vegetation or bio-film



## OUR NOVELTY !! KEELCRAB-ROBOT

### REMOTE CONTROL ROBOT FOR HULL BOAT CLEANING & INSPECTION

- *Not Dangerous*
- *Fast & user friendly*
- *Light & transportable*
- *Immediate effect*
- *Usable anywhere*
- *Nylon filter for waste material*
- *Hight-level material*
- *Entirely Made in Italy*



  
KEELCRAB™



<https://www.youtube.com/watch?v=JGlrVnIPqGQ>

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## OUR NOVELTY !! KEELCRAB-ROBOT

*Waterline cleaning*



*Hull inspection*



*Hull cleaning*



### DESCRIPTION & PRICE

**Hydrostatic neutral axis:** only 9.5 KG weighs

**Central propeller:** powered by a powerful electric motor, and provides the dual functions of maintaining the robot adhered to the hull and vacuuming algae in a nylon bag

**Movement:** sponges and brushes with rubber bristles and belts that ensure elevated drivability on all types of surfaces

**Removal of the algae:** is guaranteed using central brushes, easily interchangeable according to the conditions of the hull

**Underwater video camera & powerful LED** permit high definition visualization of video

**Retail price:** 3.500 Euros (new keelcrab Sail One 2015)

### MAIN TECHNICAL FEATURES

- *Input power supply 220 volt*
- *Output power supply 48 volt (low voltage)*
- *Hourly consumption 200 watts*
- *Cleaning time 45 seconds/m<sup>2</sup>*
- *Remote control with 7-inch HD display*
- *Power supply cable (20 m standard) semi-floating with Kevlar core (120 kg traction)*
- *Guarantee 24 months or 500 hours*
- *Easy interchangeable brushes with different abrasive levels*



## BUSINESS MODEL: KEELCRAB SHARING CONCEPT

### KEELCRAB SHARING: INTERNAL MARKET ONLY (2015/2016)

*“underwater lawn mower (garden machine) with the advantage of having great many gardens (boat hulls) concentrated in a very small space (ports/docks)”*

*“..Commercial, not just technological innovation: **“We won’t rest until every hull has been cleaned with Keelcrab robots!”***

*Retailers operating in a marina, operators in the refitting sector, private marinas or harbourmasters, enrich your services package with the robots in the Keelcrab range, offering your customers improved safety and benefits. Robotic hull cleaning and inspection services, by hiring the device out at an hourly rate to professionals or directly to shipowner  
Keelcrab: the future, today!...”*

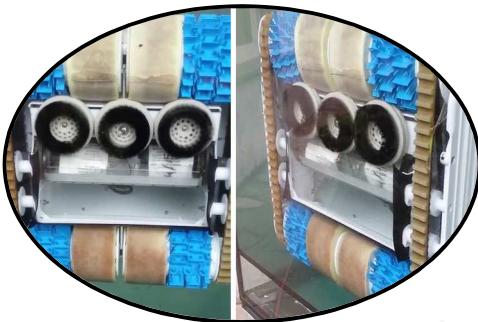
TOTEM - CRAB





## NEWS - R&D - PATENT PENDING

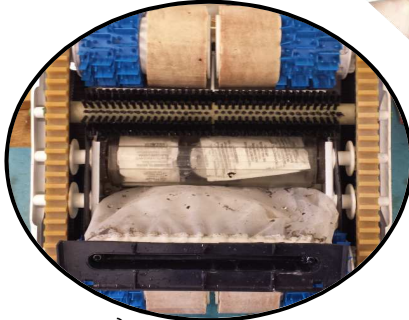
**NEW SCRUB BRUSHES**



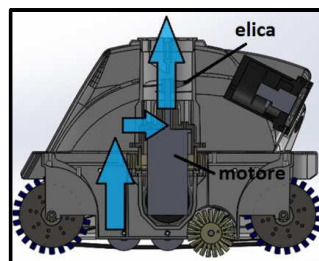
**ULTRASOUND WAVES**



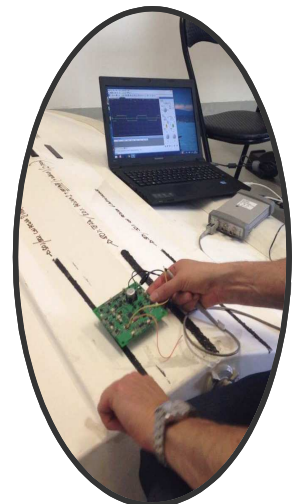
**NYLON FILTERS BAG FOR WASTE MATERIAL**



**VACUUM EFFECT**



**MAGNETIC TRACK**



  
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*“The difficulty lies not so much in  
developing new ideas as in escaping from  
old ones.”*

KEYNES

