WAKE UP !

A Study on the Evolution of the Product [Alarm Clock]

by: Gabriel J. A. Knoop, Yule S. Post,
Hendrik P. Lucka & Merlin C. Everding

index foreword

In order to getter a better understanding of the product development and design, it is necessary to take a closer look at certain events of the past and „time" itself. Time describes the sequence of events and thus has a clear, irreversible direction. It influences our daily life, our perception of it and everything that surrounds us. Probably the most distinctive characteristic of time is the fact that there always seems to be an actual point in time which we call the present, which unstoppably moves from the past to the future.
Time as we understand it is a human concept and there are hundreds of philosophical approaches to understanding it.

To make time more tangible, people invented time measuring devices.
The history of these can be traced back to the Sumerians and Egyptians.
Mechanical watches with a verge escapement originated around 1300 in Europe and became the standard time measuring instrument. Quartz clocks were invented in the 20th century, followed by atomic clocks.

In the years 1884-1924, based on the theory of Sanford Fleming, humans agreed on a world-wide usable time system, short GMT, which allowed to have the same time indicated everywhere on earth.
It was not until the year 1972 that the coordinated world time - realized by atomic clocks - was used as world time.

This man-made system requires punctuality and therefore it was necessary to build a machine that would produce a sound at a pre-set time to waken up and remember. Machines that act against the natural human rhythm in order to follow the system. May it be work, school or the Tantra workshop - everything begins and ends at a certain time.

The Alarm Clock was invented.
A product, almost every person has a very contradictory relationship to. You despise it while you´d be lost without it. Many late risers claim that the alarm clock is the devil´s creation or simply an invention of the capitalists.

The Greek philosopher Plato already converted a water clock into a wake-up machine in the 4th century B.C.
Leonardo da Vinci developed the water wake-up machine in 1420.
The first alarm clock was invented in 1787 by Levi Hutchins in the USA. But it could only ring at 4 o'clock in the morning. The first alarm clock with mechanical movement and adjustable time was patented in 1847 by the French inventor Antoine Redier.

From then until today it is a long way in the history of the alarm clock and we can see that clearly in the last hundred years of product design.
The sales catalogue of the Guarantee Association of German Watchmakers of 1913 shows an expansion of alarm clock models and a diversification in case shape, colour or clock face design.
In industrial society, the new everyday watch was to be perfected and adapted to the taste of times. The design aspect then played an increasingly important role for alarm clocks.

The customer wanted high-quality alarm clocks. These so called "Stil Wecker" were characterized by a higher elaborate materials and often a non alarm clock typical design.
The approach to produce high-quality alarm clocks seems to be lost over the years, only a few designers continue this approach still today.

What is the difference between the alarm clocks of the last and this century and what do they all have in common? What do they look like inside and how are they composed? Why do people still use an alarm clock in the age of the smartphone?
And what about this damn punctuality?

History

Alarm clock types

Early history of alarm clocks

Gothic iron clock with alarm clock, c. 1580

Renaissance and Baroque

Officer's alarm clock, Vienna around 1820,

Industrialization and alarm clocks

Wecker Globe, Ansonia Clock Company, New York, around 1880

baby alarm

Baby alarm clock, Badische Uhrenfabrik, Furtwangen, ca. 1925

travel alarm

Travel Alarm Clock, Treasure, Triberg, c. 1956

radio alarm

Radio alarm clock or alarm clock radio Jubilate, Telefunken, Berlin, 1954,

For a long time, watches were luxury items. For the vast majority of the population, sleep ended when it became light or when the cock crowed. The few who had to get up before dusk were awakened by the night watchman.

But clocks with an additional alarm function have existed for as long as wheel clocks, i.e. since the 14th century. Dante's masterpiece, his „Divine Comedy" from 1320, contains the first precise description of a movement. Even this movement is equipped with an alarm mechanism.

With the invention of the balance wheel and the spring as energy storage, the watches became mobile - even those with an alarm function. They were popular as luxury accessories for rich citizens and aristocrats. However, they were not yet usable on the journey, but only in the night quarters or at the point of arrival.

In the second half of the 19th century, workers and employees had to arrive on time for work. Robust wooden clocks from the workshops and smaller factories of the Black Forest were for a long time the cheapest way to be reliably woken up. Industrially produced table clocks with an alarm function based on the American model of „cottage clocks" were somewhat more expensive. These first mass-produced clocks often had an alarm clock.

The baby alarm clock has strongly influenced the appearance of the alarm clock. Industrialization in the 19th century changed social life. The new way of working in the factories forced people to submit to temporal discipline. Shift work brought with it a changing start of work, so that there were no longer uniform times for waking and getting up in a household. At the same time, punctuality was important.

Already with the invention of portable watches, alarm clocks had become mobile in the 16th century thanks to the spring as an energy store and the balance wheel. In the 1920s, travel alarm clocks became a mass-produced item with increasing mobility.

In the early 1930s, numerous patent applications for radio time switches were received both in Europe and in the USA. The first radio alarm clock to be mass-produced was the Musalarm 8H59 from the US company Telechron. The watch is based on the patent of Francesco Collura, who combined a „radio receiver and a timer" in 1946.

Differentiation based on equipment features

digital readout

Digital alarm clocks have an electronic clockwork with the possibility of outputting various data via a display. This makes it possible to integrate numerous additional functions, which would not be possible in mechanical or electromechanical alarm clocks.

Projection of the display

For operation in the darkness of the bedroom, there are different approaches to make it possible to read the current time at any time. In addition to conventional illuminated dials, today there is often a simple optical system that projects a self-illuminating digital display onto the wall or ceiling.

radio module

Many electronic alarm clocks have a radio module for automatic setting and adjustment of the time via the DCF77 radio signal of the Physikalisch-Technische Bundesanstalt. This avoids, among other things, operating errors caused by the (possibly forgotten) changeover to daylight saving time.

24-h alarm time scale

With analogue alarm clocks, the 12-hour dial causes the problem that the alarm clock wakes up every 12 hours. The user has to switch on the alarm clock in the evening to use the alarm function. For this reason, some analogue alarm clocks have either a 24-hour dial (like analogue timers) or at least a 24-hour scale for the alarm function.

snooze button

The snooze button is often found on electronic alarm clocks and clock radios - mostly on the top of the device. It is often especially large to make it easier to find in the dark. When pressed, it interrupts the alarm signal and restarts it five to ten minutes later, depending on the device.

light alarm

Light alarm clocks are alarm clocks that awaken by gradually or continuously illuminating the room. The simulated sunrise is intended to slowly prepare the human organism for rising.

Alarm clock with special wake-up functions

Alarm clock for deaf and hard of hearing people

These alarm clocks have, in addition to or in place of the audible signaling device, flashing beacons emitting strong flashes of light, or a device that triggers vibration to wake up persons with impaired hearing. If a hearing loss is caused by an accident at work, the statutory accident insurance in Germany sometimes also pays for such an alarm clock.

sleep phase alarm clock

Sleep phase alarm clocks (also biorhythm alarm clocks) wake up during a light REM sleep phase. Due to the physical restlessness and movement in the bed, the sensor determines the light sleep phase and wakes up appropriately in a predefined time window.

Movable versions

The goal of alarm clocks with moving elements is to prompt the person to be alarmed to turn off the alarm clock to become active. This includes locating the alarm clock or parts of it, performing sporting activities with a dumbbell-shaped alarm clock, or aiming a spot of light at an alarm clock with a target.

Mechanical Manual winding alarm clock

Desktop unit
Alarm clock
Year: 1964

It consists mainly of robust metal parts, sheet steel, brass and spring steel are processed. Only the protective disk is made of plastic, which makes it susceptible to scratches. The alarm and clockwork consist of various small gears that start moving when the springs are wound. When the alarm sound is triggered, the hammer of the alarm anchor hits the metal case from the inside. All parts are screwed together or plugged into each other. Despite the small size of this alarm clock, repairing or reassembling it seems more realistic than with more complex electronic alarm clocks, since all parts are logically and mechanically related to each other.

PRODUCT INFORMATION

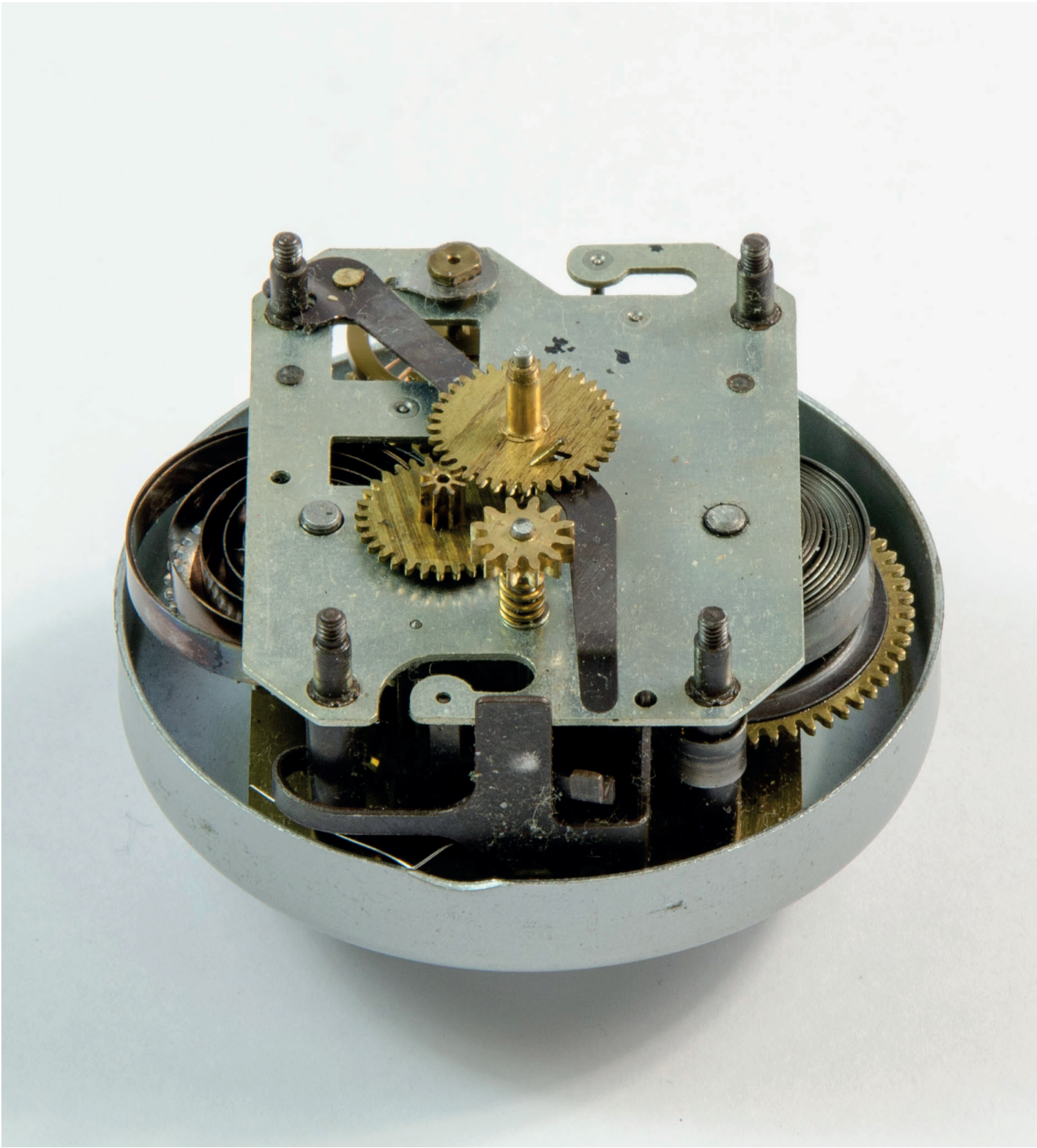| HOUSING	PROTECTING GLASS	CLOCK-FACE	GEARS	WATCH HANDS	WINDING LEVER
metal	acrylic glass	metal	brass	3	4

DIMENSIONS	OPERATING MODE / VOLT	MANUFACTURER / BRAND			
80 X 70 X 30 cm	Mechanical watch movement	unfamiliar			

Mechanical
manual winding
alarm

Mechanical movement : Small parts, many components which mesh

Components of the
alarm clock

Mechanical
manual winding
alarm

Observations:

Housing:
metal, cardboard dial printed and glued on
Complications during disassembly, very small
parts
Inner workings: mechanical clockwork

Properties:
Tick Sound: Yes
can save wake-up time: No
Dial: Analogue
Snooze function: No
Light: No
One alarm tone: Yes

SCREWS
[2 st.]

SWITCHES
8 st.

CIRCUIT BOARDS
0 st.

CLOCK HANDS
3 st.

GEARS
9 st.

CORD
0 cm

INJECTION-MOULDED PARTS
0

CLOCK-FACE
1 : Blech

NUTS
8 st.

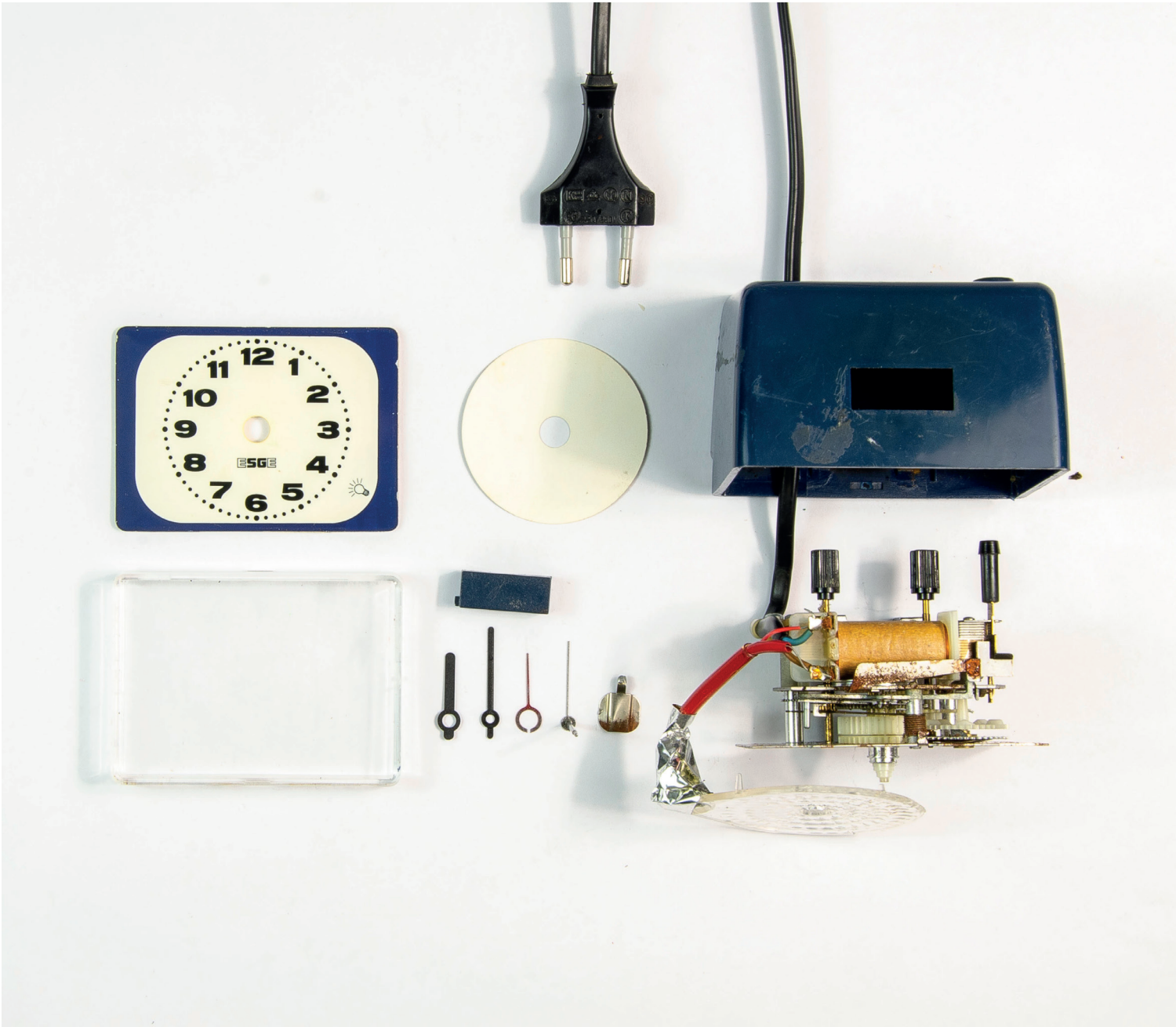**TENSION SPRINGS**
3 st.

EGSE MN-123 clock alarm

Desktop unit with integrated clock Year: 1964

The ESGE alarm clock is a combination of mechanical and electronic components. It is not wound by hand but simply plugged into the socket. However, the clock and alarm time are set manually with rotary knobs. The housing is made of thermoplastic material, i.e. an injection-moulded part. The inner workings of this alarm clock largely function mechanically with gears, which, however, are not set in motion by springs but by an electric motor. No circuit boards are used and the functions of the individual parts are clear and easy to understand. The device could be dismantled into its individual parts in just a few minutes.

PRODUCT INFORMATION

MATERIAL	DIMENSIONS)	OPERATING MODE / VOLT	WAVE RANGES	SPEAKERS	MANUFACTURER / BRAND
PLASTIC CASING THERMOPLASTIC	93 X 78 X 62 mm	alternating current supply / 220 Volt	Medium wave and FM.	Dynamic LS, no excitation coil (permanent dynamic)	ESGE; METTLEN

**mechanical
electronic
clockwork**

Observations:

EGSE MN-123
Case machine-made. injection moulded from plastic X & screwed, dial made of cardboard, made in Germany

Inner workings
mechanical electronic clockwork

Properties:
Ticking loud: Yes
Can save wake-up time: Yes
Can set alarm tone: No
Dial: Analogue
Snooze function: No
Light: Yes

Components of the alarm clock

**mechanical
electronic
clockwork**

Mechanical movement : Small parts, many components that have to mesh together.
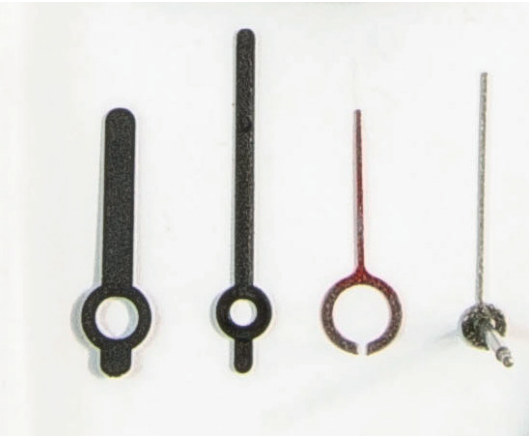
SCREWS
2 st.

SWITCHES
0 st.

CIRCUIT BOARDS
0 st.

CLOCK HANDS
4 st.

GEARS
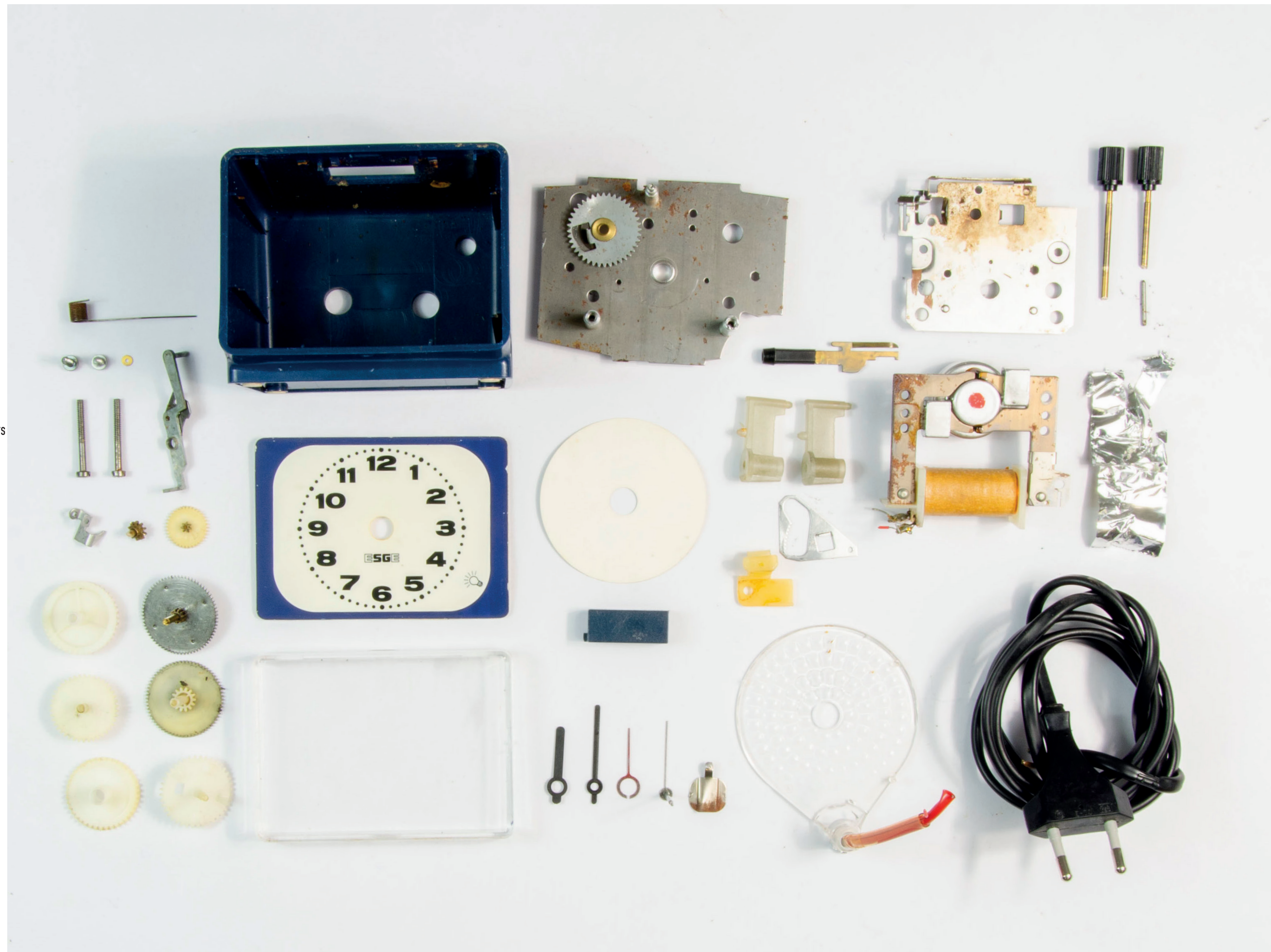8 st.

CORD
0 cm

INJECTION-MOULDED PARTS
2

CLOCK-FACE
1 :cardboard

SPEAKERS
1 st.

Radio Clock Cassette Player OCR-288

Desktop unit with integrated clock (clock radio, clock radio)
Year: 1982

This multifunctional, cube-shaped cassette/radio alarm clock was surprisingly easy to take apart. It consists mainly of injection moulded plastic parts that are screwed together. All smaller individual parts and circuit boards are located in a kind of inlay, which is like a drawer in the outer housing. After the first screws had been loosened, the bottom of the device could be removed and so the first look inside was possible. To our surprise, we were surprised to see not only circuit boards and cables, but also a mechanical pulley-cord system similar to a bottle pull, which is used to adjust the radio station. The majority of the circuit boards, cables and plastic parts are responsible for the function of the radio and cassette player. The alarm itself functions through a single battery, a small circuit board, and plastic gears. It was also interesting that the circuit boards were still soldered by hand. The power supply is possible with batteries or mains connection.

PRODUCT INFORMATION

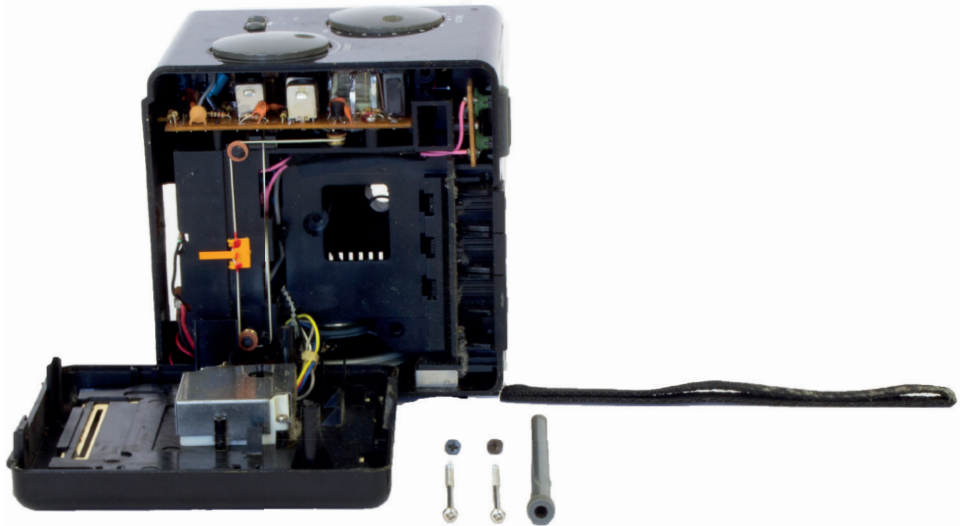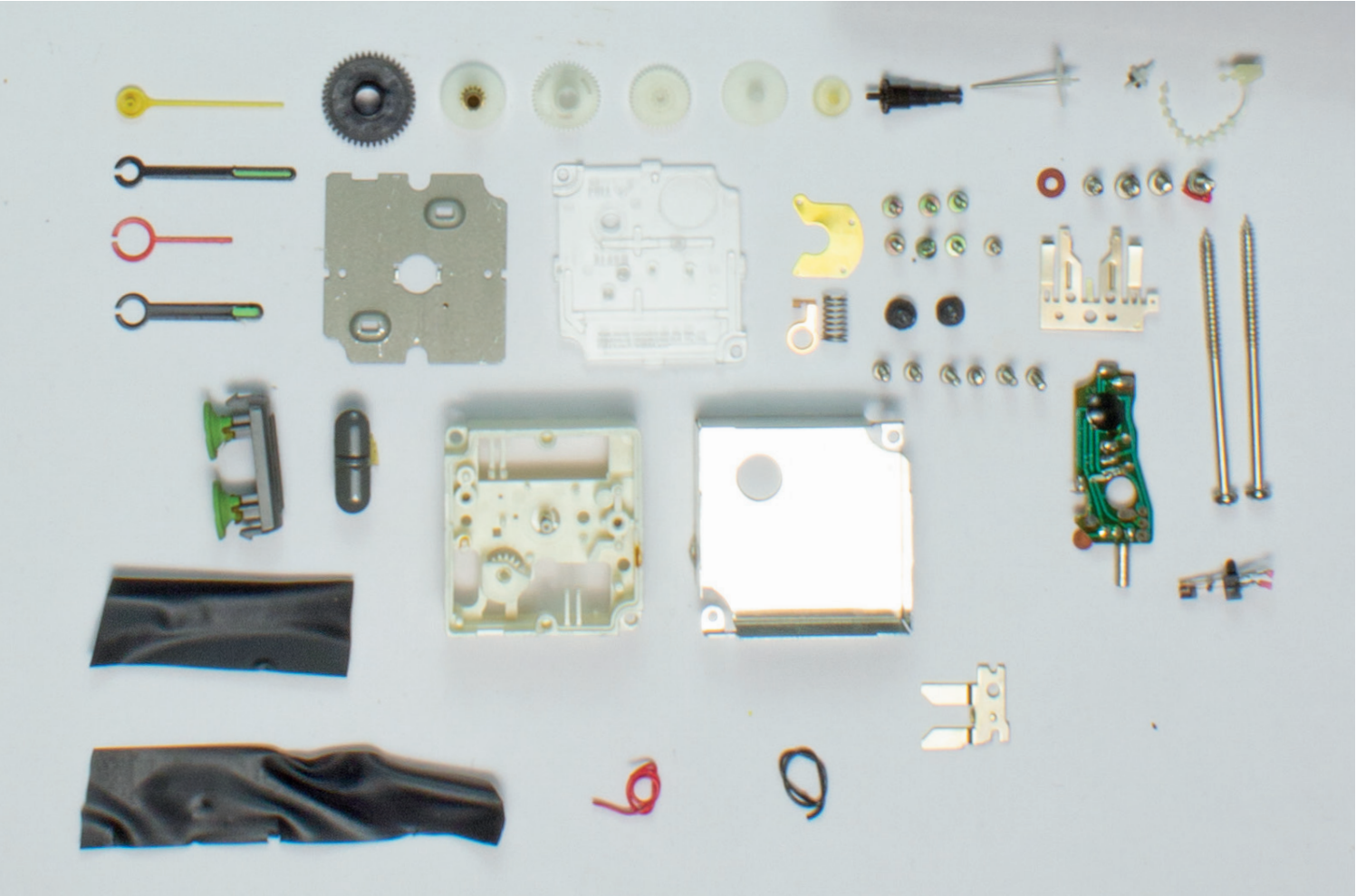| MATERIAL	DIMENSIONS	OPERATING MODE / VOLT	WAVE RANGES	SPEAKERS	MANUFACTURER / BRAND
plastic casing thermoplastic	125 X 125 X 125 mm	Batteries / low voltage power supply (power jack) / 4 × 1.5 / 6 Volt	Medium wave and FM.	Dynamic LS, no excitation coil (permanent dynamic)	ECOTRONICS GMBH

Components of the
alarm clock

**Radio Cassette
Player OCR-228**

Observations:

case
Injection moulded and bolted
plastic

Inner workings:
Mostly electronic/machined; striking PCBs
hand soldered, pulley controls radio

Properties:
Ticking loud: No
Can save wake-up time: Yes
Can set alarm tone: Yes
Dial: Analogue
Snooze function: Yes
Light: No

SCREWS
21 st.

SWITCHES
8 st.

CIRCUIT BOARDS
5 st.

CLOCK HANDS
4 st.

GEARS
8 st.

CORD
429 cm

INJECTION-MOULDED PARTS
7

CLOCK-FACE
1 cardboard

SPEAKERS
1 st.

Digital Radio Wecker

Desktop unit with integrated clock Radio Controlled Year: 2000+

The latest alarm clock is battery powered and completely digital. The case is also made of plastic, injection molded. Gears are not to be found here. All functions are controlled by machine-made circuit boards. There is an LCD display on which the time is indicated. The control of the alarm works with different pressure switches. It has the fewest parts of all examined devices and is operated by a single battery.

PRODUCT INFORMATION

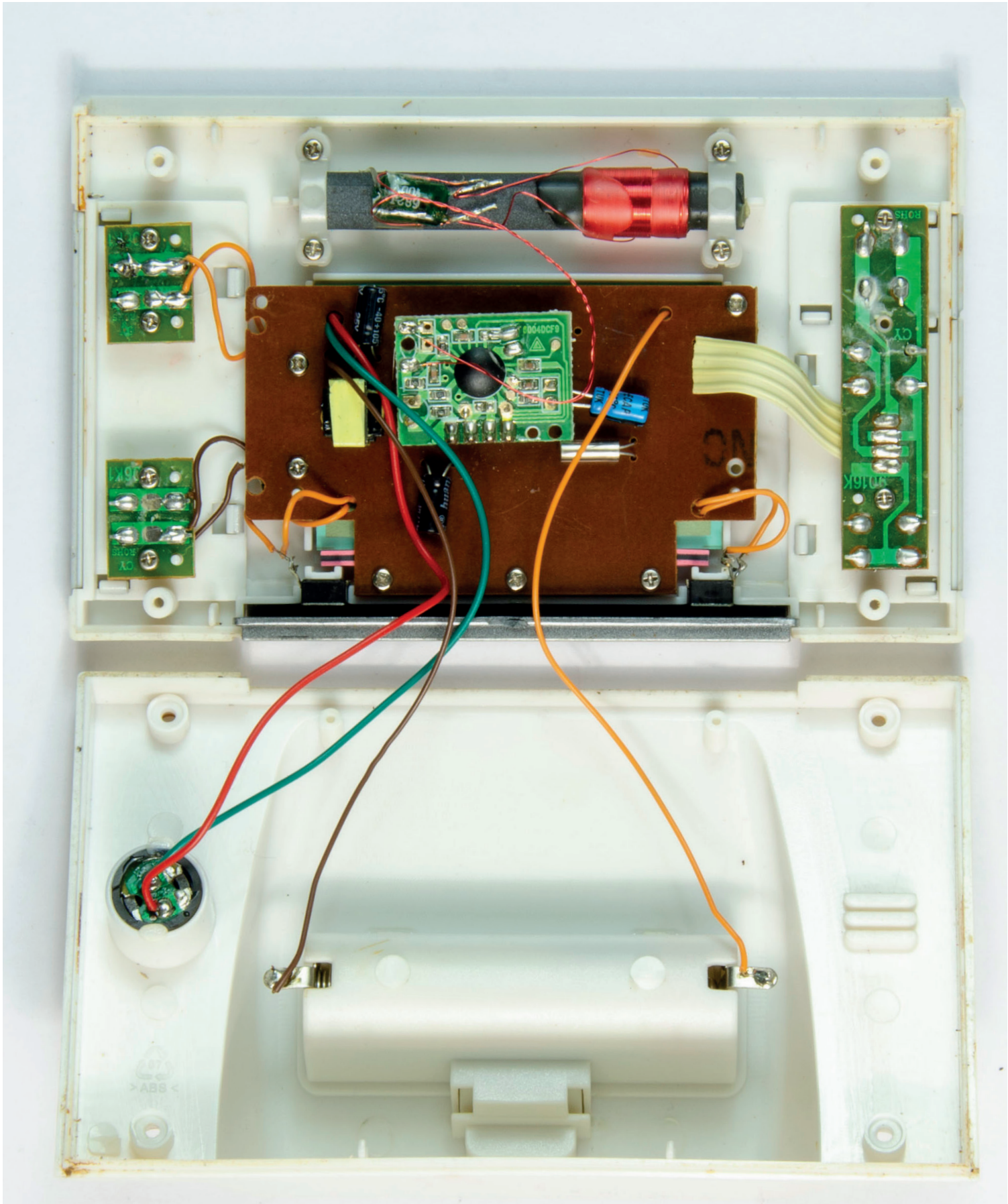| MATERIAL	DIMENSIONS	OPERATING MODE / VOLT	WAVE RANGES	SPEAKERS	MANUFACTURER / BRAND
plastic casing thermoplastic	120 X 75 X 50 mm	Batteries / low voltage power supply (power jack) / 4 × 1.5 / 6 Volt	Medium wave and FM.	Dynamic LS, no ex-citation coil (perma-nent dynamic)	ECOTRONICS GMBH
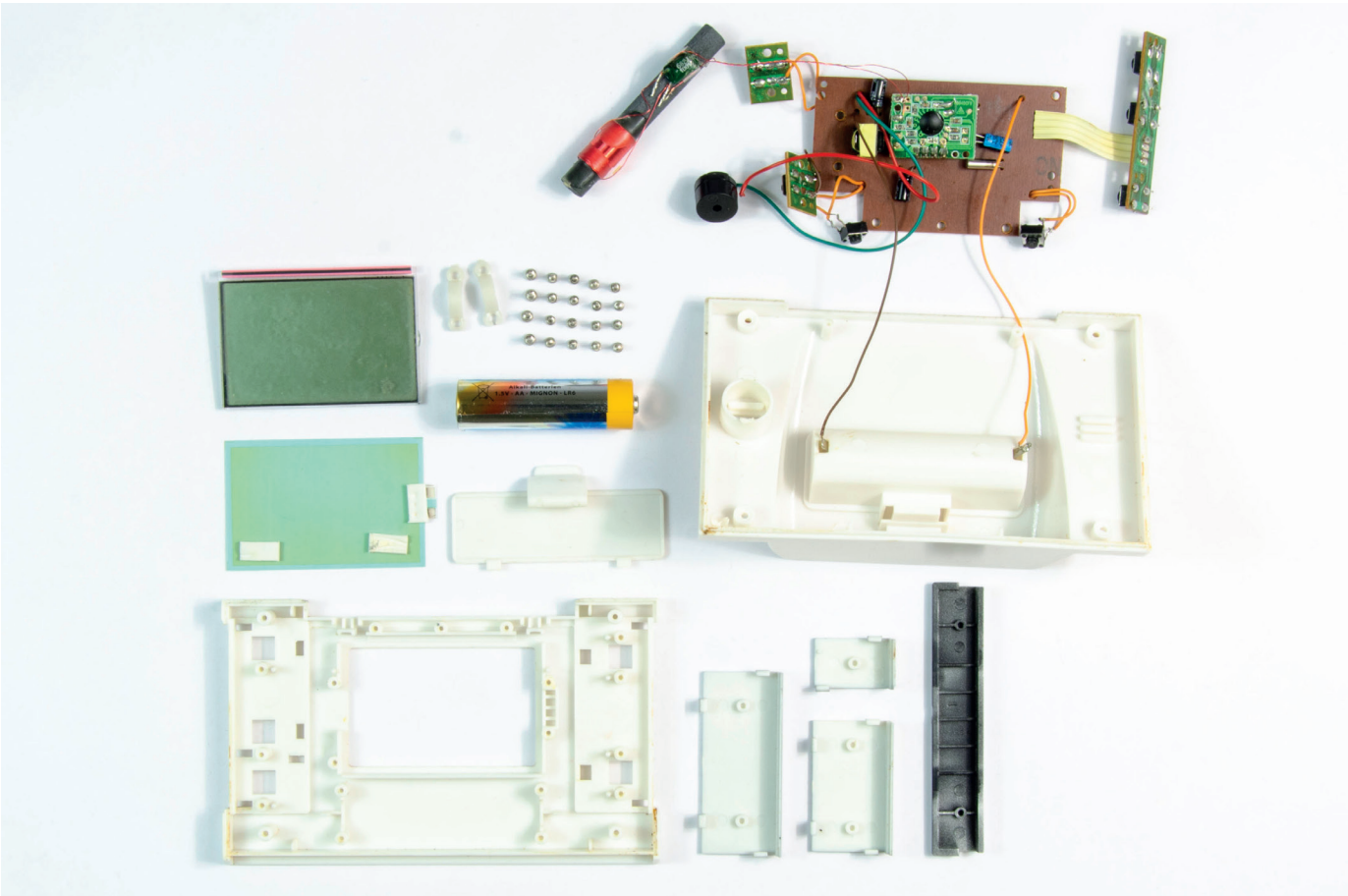
**radio-controlled
alarm clock**

Observations:

radio-controlled alarm clock
Case machine-made. injection molded from
ABS7 plastic & screwed, time display digital,
LCD display, made in China

Inner workings: fully electronic
Machine soldered, hand wired,
isolated and assembled.
Boards screwed together, loudspeakers glued in
various switches/functions
Rather inferior workmanship

Properties:
Ticking loud: No
Can save wake-up time: Yes
Can set alarm tone: No
Dial: Digital
Snooze function: Yes
Light: Yes

Components of the
alarm clock

SCREWS
20 st.

SWITCHES
7 st.

CIRCUIT BOARDS
3 st.

UHRZEIGER
0 st.

GEARS
0 st.

CORD
64.9 cm

INJECTION-MOULDED PARTS
7

CLOCK-FACE
DIGITAL DISPLAY
LCD

conclusion

What all alarm clocks have in common:

We can set the time when we want to be woken up and to wake up the alarm clock makes a shrill sound. What distinguishes them: Their construction - A distinction is made between a mechanical and an electronic inner working. The mechanical alarm clock has a delicate and complex clockwork consisting of gears made of various metals, mainsprings, springs and a small hammer that generates the alarm tone together with the sound body. The inner workings are usually joined together by screws, anchors and connectors. The case is usually made of metal, as it serves as a sound body. If not it is made of injection-molded, thermoplastic material. However, the electronic alarm clock is also assembled from a lot of small parts on the inside, but additionally there are meters of cables, which connect and move the individual components instead of the gears. Circuit boards control the individual functions.
The individual parts are screwed, glued or plugged in one another. The case is machine-made from injection-moulded thermoplastic material.

In theory, the alarm clock has become an obsolete product. People don't really need it anymore - every smartphone and mobile phone - even ones of the somewhat older generation - have a built-in clock and an additional alarm function. However, it is arguable whether it is good to use the smartphone as an alarm clock. Be it the radiation, the beeps at night, or the morning check of e-mails, news, appointments, the weather and all the social media channels.

People in the 21st century know more about the recent world events than they do about their own appearance in the mirror when they look at the clock or simply turn off the snooze function.
Be that as it may. Every newer mobile phone also has a camera built in - it can be argued that the quality of the pictures leads to not only wanting to commit oneself to the mobile phone camera, while there are no such differences in quality with the alarm clock in a phone. Quality is characterized by the enthusiasm for the mechanical inner workings of an old school Alarm clock, or the design.

Why choose a conventional alarm clock?
Whether analog, digital, a rooster that crows and has to be thrown against the wall to be turned off, an alarm clock that rolls away, or one that only stops ringing when you have solved mathematical problems correctly, or the mobile alarm clock - the choice of how you want to be woken up is purely subjective.
And even if everything around us is getting smarter and smarter, and smartphones, smart homes, smart watches or smart glasses have already dominated the lives of some of us, there are certainly still many who don't want to live without their alarm clock, which can´t do anything more than simply wake you up.
You use what you like and what works best for you. Every alarm clock has only this one function - it has to wake you up, mostly with an acoustic signal - and that reliably.

Mechanical Manual winding alarm clock

EGSE MN-123 alarm clock

Digital Radio alarm

Radio Clock Cassette Player OCR-288

The way to the future

what will the life of the alarm clock be like? Is it still necessary or completely superfluous in its form as we know it today? What does the future of the alarm clock look like?

One asks oneself the question whether we can still extend the use of an alarm clock and if so - how?
Is it already enough that we carry our alarm clocks, together with many other features compressed all in one machine with us day in and day out?

Sleep phase alarm clocks and apps like Sleepcycle, which have become commercially available already show such an evolution in product development.
A sleep phase alarm clock is a special alarm clock that wakes up a sleeping person regarding to their current sleep phase to prevent them from being torn out of their deep sleep.
Different to a normal alarm clock, it wakes you up within a period of time rather than a set time.
This other way of „getting woken up" works well and becomes more and more popular.
Newer smartphones are already equipped with it so there is no need to download the app for it anymore.

It can therefore be said that the product Alarm Clock, as it exists will not experience a „revival", but the "awakening" itself will.

Nowadays multifunctional tools, such as the smartphone, continue to become more and more indispensable. The concept „smart living" - a living space that can be personalized, i.e. adapted to personal needs and lifestyles. Heating systems, security systems, door and window control, music and much more can be controlled wirelessly.
It is already possible to set a concrete time at which blinds should be opened and closed or when specific music should be played as an example.

Getting woken up is an essential part of our life. Some Sci-fi movies and series show an exaggerated idea how this could look like in the future.
It is an outdated way of thinking that a working day begins in the early morning and ends in the late evening.
Today, many people work from home, are more independent and much more flexible.
In some countries, school systems are even changing so that lessons start in the afternoon. Appointments that previously had to be held in person on site can now be done flexibly online.

Looking at world events, it is considerable that the wake-up time could be changed from „at a certain time" to „in a certain period" to „when it is most efficient for you". If you think about "waking up", it's not about designing a device or a product, but about developing a new way of functioning in society in which we are influenced by smart technology in pretty much all areas of life. The question arises as to whether this is about profitability, health or simply personal self-development. But ultimately, all these forces should work well together to make us function in the modern world.

Scene from Black Mirror
The protagonist is being replaced by an rooster rooster awakened

Scene from The Fifth Element

I Phone Alarm Clock

Google Glasses

The way to the future

The everyday helpers of the future

Good morning Mia

„Good morning Mia, you had a good night!" it sounds quietly from the loudspeakers on the ceiling. Mia opens her eyes. The blinds automatically raise, sunlight falls through the windows in her bedroom. Ben has taken care of everything. Mia likes to be woken up by his voice and the sun's rays.

„Mia, your pulse was calmer than it has been for a long time - you slept well," says Ben. Mia feels well rested. Ben would never wake her up in deep sleep, he's too smart for that. Ben waits until Mia has a deep sleep phase behind her. Unless her calendar pushes for an early start to the morning, then Ben knows about it and opens the blinds a little earlier. In return he makes her an extra strong coffee later on.
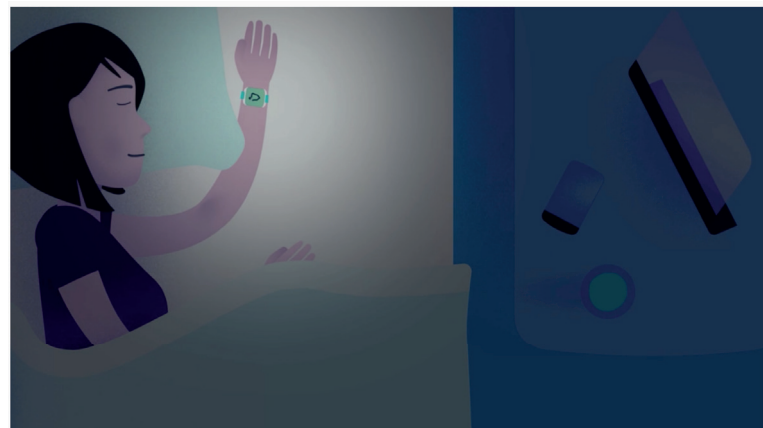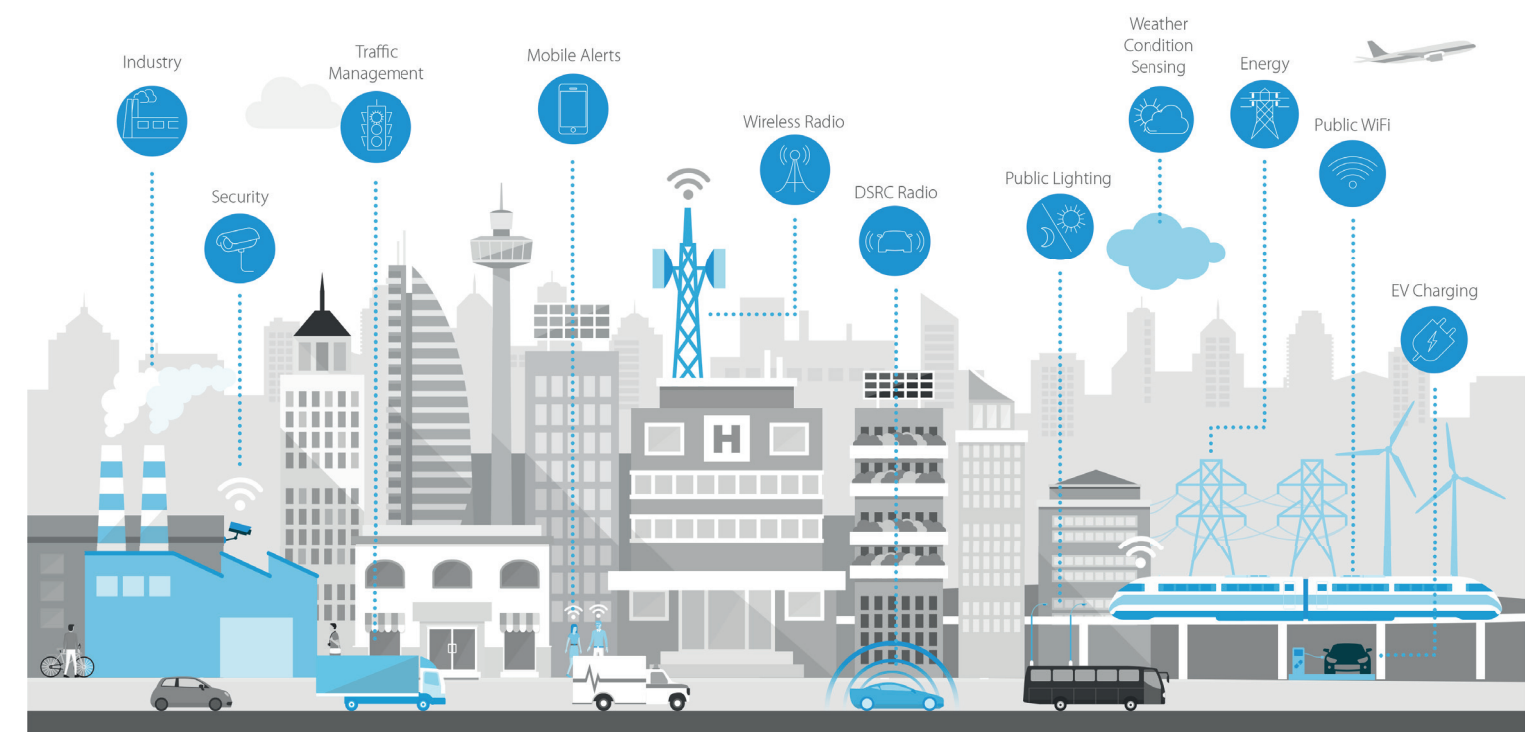
Much of what Mia experiences in the early morning is already possible today - but not yet suitable for the masses in combination. „Until 2037 it will be standard to be accompanied and supported throughout the day by an Artificial Intelligence (AI) like Ben," says Christopher Lindinger, futurologist at the Ars Electronica Futurelab in Linz. Apple's Siri and Amazon's Alexa are already harbingers for such personalized assistants, but they have very little to offer so far, and they are tied to just one device.
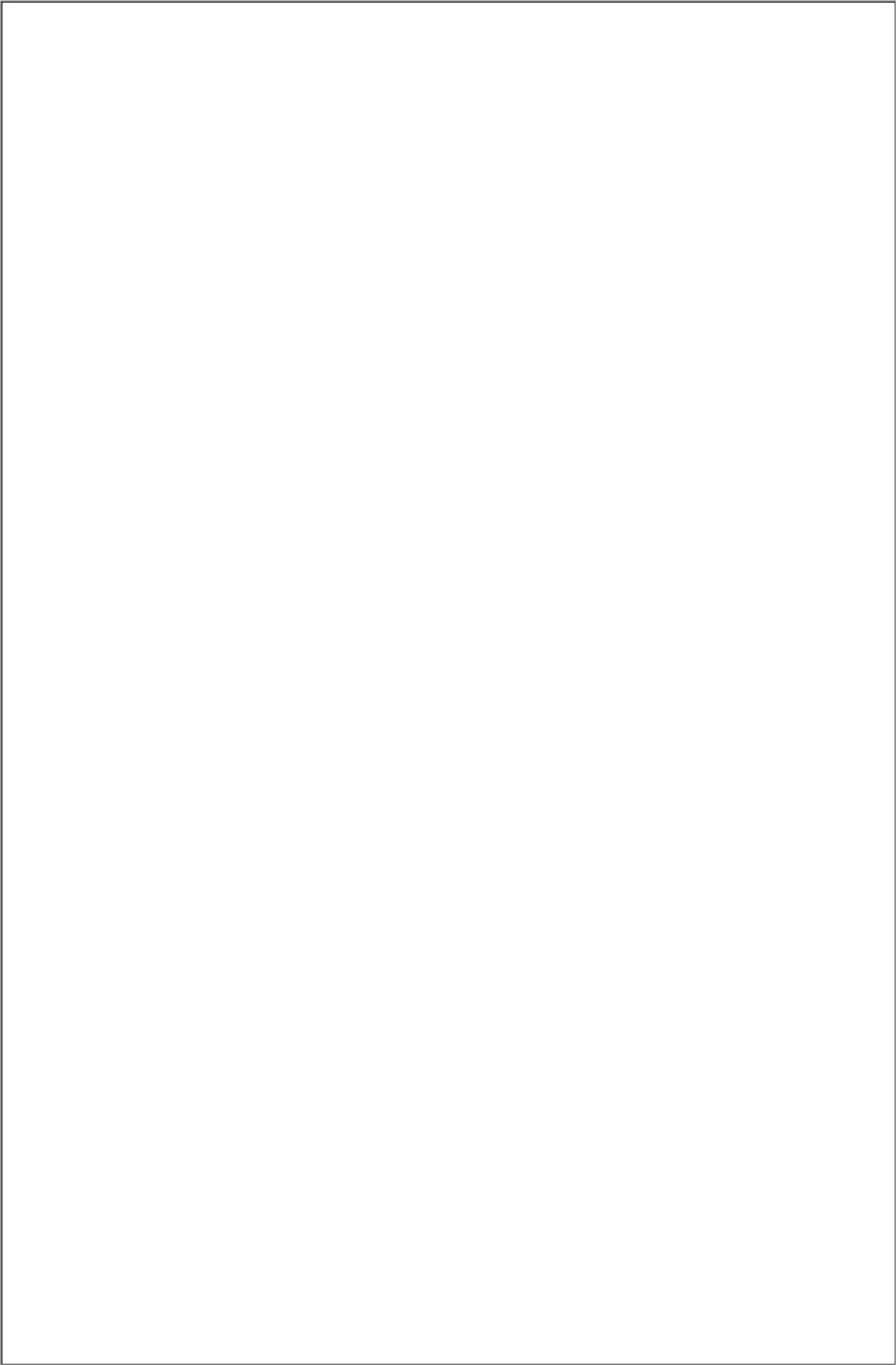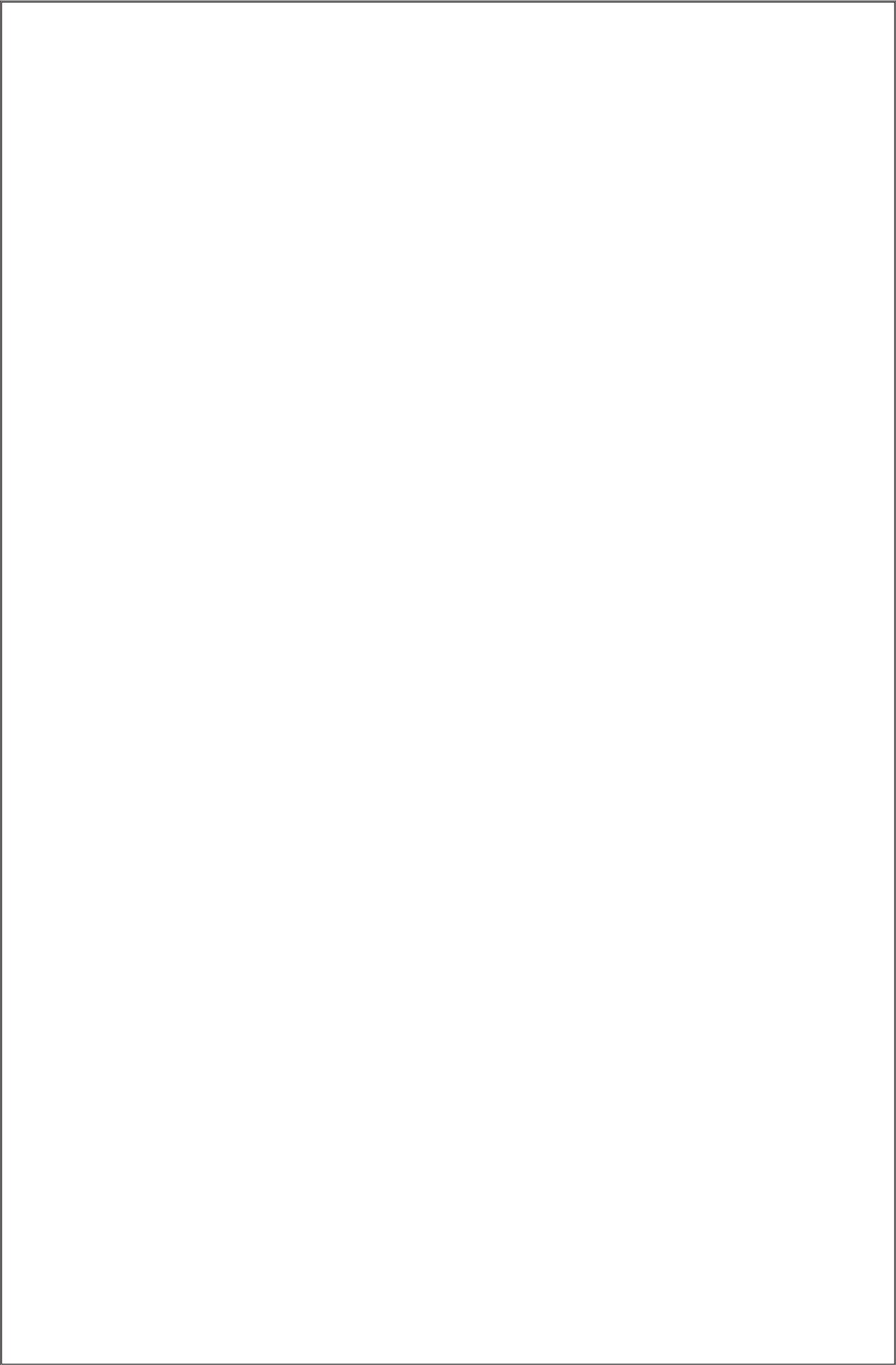„The vision that computers will outperform human thinking cannot be foreseen. However, such systems can very well specialize in a single activity, such as comparing a lot of data in a very short time," says Lindinger. In the 2030s, CI's will no longer be recognizable as computers. Every object, every piece of clothing, every wall will contain a chip that is connected to the Internet. On the one hand, the AI collects data via sensors on the devices, on the other it controls them and makes use of them. Today we call this principle the „Internet of Things". Today, around 25 billion devices are already connected to the Internet. According to calculations, this figure is expected to rise to 50 billion by 2020, an average of seven devices per person.

https://www.spiegel.de/wirtschaft/deutschland-in-der-zukunft-wie-wir-2037-leben-werden-a-1183331.html

The everyday helpers of the future

Time link with everyday helpers

How will the city change if everything is connected? Will we be notified when the best time to visit a supermarket is when all the checkouts are empty ? or will we be asked to get up later because the S-Bahn is overcrowded and it doesn't make sense to leave at rush hour?

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